MODERN MECHANIX AND INVENTIONS

JULY

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SEE PAGE 72

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New INVENTION

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MOTORIST SAVES $180.00 a YEAR*

Saves up to Thirty Per Cent On Gas. Provides Faster Pick-Up—More Power—Greater Mileage and Smoother Running.

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112 CAPITAL BANK BUILDING

General Agents

March 15, 1934.

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Vacu-matic Carburetor Co.
7617 W. State St.
Wauwatosa, Wisconsin.

Gentlemen:

I thought it might be interesting for you to know that I had an automatic gas consumption tester attached to my Plymouth Six and obtained an average of 15 miles to the gallon. I then installed your Vacu-matic to satisfy myself as to its merits and under the same conditions and the same course of travel I obtained an average of 22 miles per gallon. At our present price of gasoline and traveling approximately 1500 miles a month, this means a saving to me of $18.00 a month or $180.00 a year.

I am writing this letter unsolicited on account of the satisfaction I have had since this installation.

You may use this letter as you see fit.

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F. S. PECK INSURANCE AGENCY,

By

FSP/H

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PATENT PENDING

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The self-starter—four wheel brakes—knee action—streamlining . . . and now VACU-MATIC! The greatest motor improvement of recent years! With it, engineers have achieved a practical means of AUTOMATICALLY balancing air and gasoline in correct proportions for ALL speeds! Functioning directly with the manifold vacuum, VACU-MATIC actually "breathes" when needed, giving your motor correct combustion. Sharply cuts fuel wastes, saves dollars in gas costs, reduces carbon and gives your engine new pep, greater power and longer life.

Agents and Salesmen

If you are interested in earning up to $15 daily, check coupon. Exclusive territories now being granted.

Fits All Cars

VACU-MATIC is constructed of six parts, electrically welded into one unit, correctly adjusted and sealed at the factory. Nothing to regulate. Any motorist can attach VACU-MATIC in ten minutes. Once in, its only reminder is the surge of instant power and speed it gives to the motor and the savings it affords your pocketbook.

The VACU-MATIC Co., Wauwatosa, Wis.

* The above letter from California is unsolicited, and is just one of the many letters received from enthusiastic users.

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The VACU-MATIC proves itself on every car. It is guaranteed to give worth-while gas savings, quicker pick-up, and more power or it costs you nothing. "On a test I gained an average of 4 miles on a gallon," writes Alex Wertz. "Vacu-matic is the best I have ever tried." Clarence Rutzin—"I have tried the Vacu-matic in several tests and find that I get between 5 and 6 miles per gallon increase, have more mileage, have greater pickup."

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Address .....

City ..... State .....

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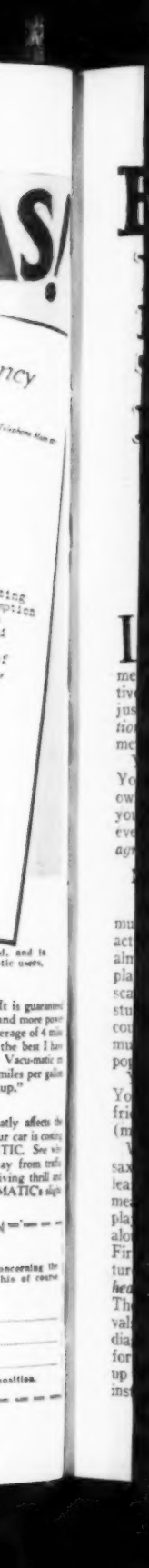

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JULY
1934

MODERN MECHANIX AND INVENTIONS

Volume XII
Number 3

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Editor

Alfred Albelli
New York Editor

Robert Page Lincoln
Hunting and Fishing Editor

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Naval Architect

Ray F. Kuns
Principal, Cincinnati Automotive Trade School

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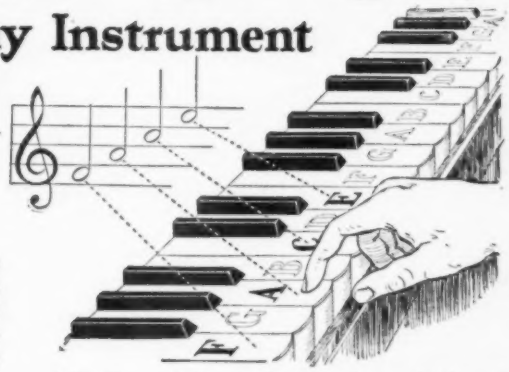

Quickest because natural and pleasant. Grateful students say they learn in a fraction of the time old, dull methods required. You play direct from notes. And the cost averages only a few cents a day!

LEARNING music is no longer a difficult task. If you can read the alphabet, you can now quickly learn to play your favorite instrument! A delightful new method has made it positively easy to become a capable performer within just a few months. And the cost is only a *fraction* of what people used to spend on the old, slow methods!

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Clarinet	Cornet
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	Flute
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Name .....

Address .....

City .....State.....

RANDOM CHIPS From

Champion workshop, selected in Workshop photo contest, shows fine layout in basement corner. Second prize winner has well equipped shop with power tools.

Here are several views of the best home workshop entered in the Workbench contest. Edward D. Fitzgerald, the first prize winner, is shown in the center photo above. Though located in a small room the shop is well fitted to turn out practically all types of workmanship.

"MM's champion home workshop"—that's the title that goes to Edward D. Fitzgerald, of New York City. If there's any doubt about Fitzgerald's right to the crown, as the sports writers would say, glance at the layout of photos above.

Fitzgerald wins first prize in the Workbench home workshop photo contest announced in the April issue. To him goes a check for five dollars. His interesting letter follows:

New York City

Dear Editor:

These Photoflood lights are very efficient. I had no idea that such detail could be had in a picture taken with them. Enclosed are a few shots from which you might be able to pick one suitable for publication.

This is my first attempt with indoor photography and though I may not make the grade this time, I will be ready for the next contest.

My shop is in a very small room and I had trouble placing the camera in a position to get a full shot of the work bench and motor table.

The motor on the lathe table slides across the table on the fixed rod and keeps the belts on each machine tight by means of its weight. I intend to add a small pulley to the drill press and take the power off the buffing head or lathe pulley.

If I win anything . . . well, I do need a new vise.

Edward D. Fitzgerald.

Fitz gets the vise. His tip on using photoflood lamps for indoor photography is a good one. Try it if you're having trouble with inside shots.

* * *

Second prize of three dollars went to John Van Lew, Jr., of Roanoke, Va., whose workshop is also well equipped. His letter says:

Roanoke, Va.

Dear Editor:

Here are several pictures of one corner of my home workshop, which I would like to enter in the contest.

I have gotten most of my ideas from your magazine for arranging the shop and tools. All the wood working machines are mounted on one bench that can be moved about the shop.

John Van Lew, Jr.

The efficient, compact arrangement of the shop can be seen in the photos on the next page. Photos received from entries in this contest prove that a very creditable workshop, equipped with power tools, can be set up in the average home basement.

* * *

At the bottom of this column is an excellent photo that comes to us from far off Melbourne, Australia. The inboard powered speed boat belongs to Carl V. Henshaw, who tells us:

Melbourne, Victoria.

Dear Editor:

As I am a reader of MM, I thought we would send you a few snaps of our little boat owned by Andy Walher and myself. We fitted a flat twin motor in this little boat hull with a chain drive to the prop shaft.

In the waters off Melbourne, Australia, Andy Walher and Carl V. Henshaw enjoy racing in this inboard motor boat.

the Editor's WORKBENCH

It has quite a turn of speed. We could only go for short trips as the motor was only air cooled (plus water which came aboard).

Carl V. Henshaw.

The day Henshaw's letter arrived a half dozen others were received from Australian readers. Names and addresses were sent to Henshaw so that Australia's MM boosters can correspond with one another.

* * *

If you want to see a compact job, look over the photo of Clayton Peterson's miniature gas buggy on this page. For inside information on the midget read this letter:

Iowa Falls, Iowa.

Dear Editor:

I have a small car that I thought someone else might like and your column being of that nature I am sending it to you. I will try to give a brief outline of it here. The entire car is but four feet long, and is powered by a Maytag ½-h.p. gasoline engine. Directly in back of the engine is a three-speed Indian transmission and clutch.

The car will do about 15 m.p.h. I have a gas engine magneto attached to the flywheel and it runs horns, lights and auxiliary ignition. The engine cools fine as the side the flywheel is on is almost entirely open. The radiator is screened and the other side of the hood has two small doors that can be closed in cold weather.

Clayton Peterson.

Clayton is 16 years old and will be glad to hear from anyone interested in his car. His home address is 1003 College Avenue, Iowa Falls, Iowa.

* * *

Here's an interesting trade deal offered by a Canadian veteran who claims to have found a way to run a marine motor at five cents a gallon:

This little car will do 15 m.p.h. It was built by Clayton Pearson who wants to hear from all readers interested in midget automobiles.

For compact arrangement this basement shop can scarcely be beaten. John Van Lew, Jr., won second prize with these photos. Note the moveable power tool bench in view above.

Hamilton, Ont.

Dear Editor:

I want a cabin cruiser. If my pension had not been cut I would have built a "Dorothy" by this time.

I have a fifteen horse power heavy duty marine motor, a standard gasoline engine, and I know how to run it at a cost of approximately five cents a gallon. In fact 90 per cent of the necessary fuel costs one cent a gallon here in Hamilton; I believe it can be obtained free in any city in the United States.

Anybody in the amateur field who has a suitable hull for my engine, the same hull to be "get-at-able" anywhere around Lakes Erie or Ontario, and who will donate that same hull for a sporting chance to make a fortune, shoot me a line. I have a good car and can pay you a visit or I can be found at home any day.

Harry Taylor.

Not having seen it, we can't vouch for Taylor's motor conversion. Anyone interested can get in touch with him by writing to the Editor's Workbench.

* * *

The latest Model T conversion into an airplane power plant comes to us from Claude Sessions. He says:

Waynesville, Ill.

Dear Editor:

The accompanying photographs show a Model T Ford motor which has been converted into an air cooled airplane motor and has

(Continued on page 16)

CHEMISTRY

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NO FIELD of human endeavor offers greater possibilities today than chemistry. All progress is dependent upon this fascinating science. And right at home, in spare time, you can learn the fundamentals by study of the International Correspondence Schools modern course. Today, ask us for complete information. Send for an interesting booklet — free.

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H. L. Wood, a clerk, made more than $700 "on the side" before he had completed his I. C. S. course and also won $125 in prizes. William Whitman, a former wagon builder, now has a sign painting business of his own and is earning *nearly three times* as much as he did before enrolling with the International Correspondence Schools. Use coupon for free booklet.

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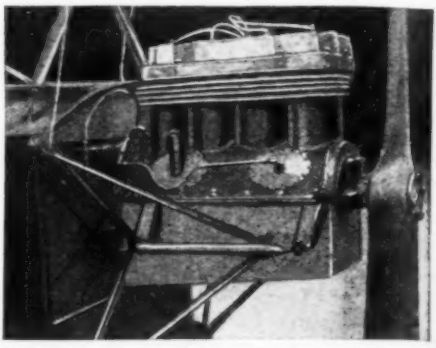
*Address*_____

Chips from Editor's Workbench

(Continued from page 15)



Here is a Model T Ford motor converted into an air-cooled airplane engine by Claude Sessions. The water jacket has been replaced by aluminum fins. Motor weighs only 150 lbs.

proved very satisfactory. The water jacket around the cylinders was removed completely, aluminum fins being attached in their place. A special aluminum alloy head was cast and machined. The complete motor weighs only 150 lbs.

This air cooled conversion was designed and built by Claude Sessions and Wilbur Smith.

Claude Sessions.

The photo shows that Sessions and Smith have done a good job.

* * *

Some flowers found in the day's mail: From Edmund H. Molbeck, proprietor of the Model Shop in Chicago—**"There are so many helpful hints in your magazine I would gladly pay $1.00 a copy for it. One of your books saved me a $7.85 repair bill."** From Bill Kaufman, Hollywood, Calif.—**"Just a note of thanks for the fine article 'How to Restring Your Own Tennis Racquet' in the May issue of MM."** From Alfredo Peres de Fagle, Baguio, Philippine Islands—**"This letter is in appreciation of the very interesting ideas which you convey to your readers. Your 'handikinks' and other ingenious ideas are so interesting that I have formed the habit of beginning to look on the pages starting at the back."**

* * *

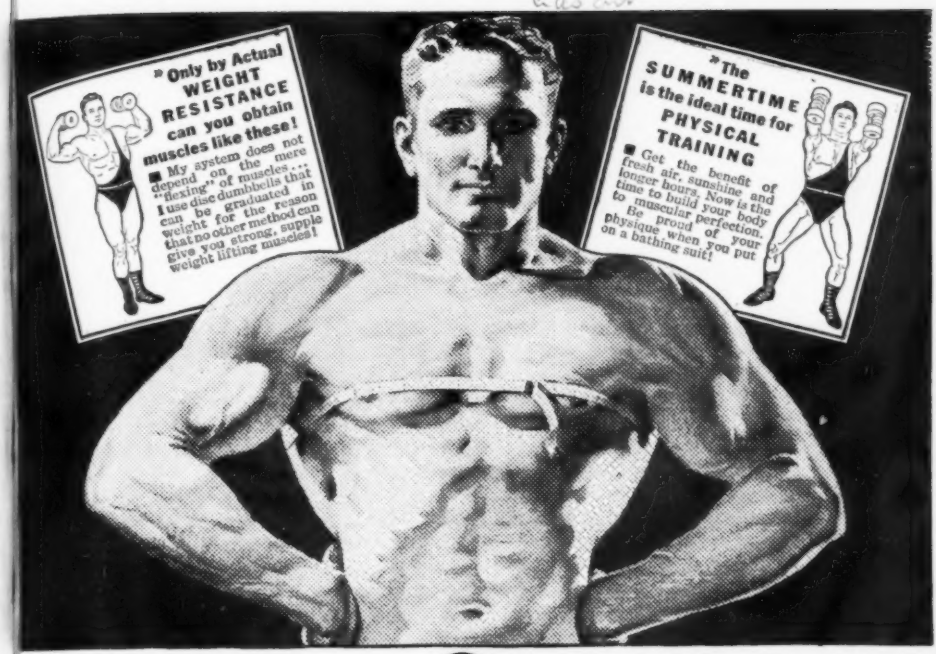
Some newsy notes from boat fans: C. Cramer, of Port Arthur, Texas, built our model sedan cruiser of match sticks and glue; Dale Hartweg, of Kansas City, skims across the water at 35 m.p.h. in his version of *Sez You*—he's working on *Scram* now.

* * *

Before closing here's a correction. Plans for *Sunray* boat are in the 1930 How-to-Build-It instead of How to Build 20 Boats, as stated last month.

* * *

Incidentally many of our readers are forgetting to include stamped addressed envelopes when asking for information from this office or our Problems department. The stamped addressed envelopes bring quicker replies. That's a tip.


» Only by Actual WEIGHT RESISTANCE can you obtain muscles like these!
■ My system does not depend on the mere "flexing" of muscles... I use disc dumbbells that can be graduated in weight for the reason that no other method can give you strong, supple weight lifting muscles!
» The SUMMERTIME is the ideal time for PHYSICAL TRAINING
■ Get the benefit of fresh air, sunshine and longer hours. Now is the time to build your body to muscular perfection. Be proud of your physique when you put on a bathing suit!

» IF YOU DO NOT ADD AT LEAST 3 INCHES TO YOUR CHEST

. . . it won't cost you one cent!"— Signed: GEORGE F. JOWETT

THREE SOLID INCHES of muscles added to your chest and at least two inches added to each of your biceps, or it won't cost you a penny. I know what I am talking about...I wouldn't dare make this startling agreement if I wasn't sure I could do it.

All I want is a chance to prove it! Those skinny fellows who are discouraged are the men I want to work with. I'll show them how to build a strong man's body...and do it quickly. And I don't mean cream-puff muscles either...I will show you how to get real, genuine invincible muscles that will make your men friends respect you and women admire you!

So many of my pupils have gained tremendous development that I am willing to stake my reputation that you can do the same... *remember*... if I fail it will cost you nothing!

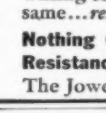
Nothing Can Take The Place of My Weight—Resistance Method With Progressive Dumbbells!

The Jowett System features the weight resistance method that has been tested and endorsed by many of the world's most famous strong men. By using this proven, scientific system of graduated weights, you can quickly develop your muscles and broaden your chest!

I Will Not Limit You to the Chest, Develop Any Part or All of Your Body!

Try any one of my test courses listed below at 25c. Or, try all six of them for only $1.00. You can't make a mistake. The assurance of the strongest armed man in the world stands behind these courses!

Send for "MOULDING A MIGHTY CHEST" A Special Course for Only 25c.



■ It will be a revelation to you. I give you my secret methods of strength development illustrated and explained as you like them! Don't wait . . . mail your order NOW!

FREE BOOK WITH PHOTOS OF FAMOUS STRONG MEN!

RUSH THE COUPON TODAY AND I WILL INCLUDE A FREE COPY OF

"Nerves of Steel...Muscles Like Iron"

It is a priceless book to the strength fan and muscle builder. Full of pictures of marvelous bodied men who tell you decisively how you can build symmetry and strength the Jowett way! Reach out—Grasp this Special Offer.

JOWETT INSTITUTE of PHYSICAL CULTURE
Dept. 37Gc, 422 Poplar Street, Scranton, Pa.

Send by return mail, prepaid, the courses checked below, for which I am enclosing $_____

☐ Moulding a Mighty Arm, 25c ☐ Moulding a Mighty Chest, 25c
☐ Moulding a Mighty Back, 25c ☐ Moulding Mighty Legs, 25c
☐ Moulding a Mighty Grip, 25c ☐ Strong Man Stunts Made Easy, 25c
☐ All 6 Books for $1.00.

*Name*_____

*Address*_____

Interesting problem letters from M-M readers are answered here.

SHORT WAVE ADAPTER

I constructed the short wave adapter in the October, 1933, M-M from old battery set parts, reducing the capacity of the tuning condensers by removing plates. The total cost including the tube was $.75. I have picked up over 200 short wave stations, including KFZ at Little America with it.

I just can't get the converter circuit in the March, 1934, M-M to work, though. Can you help me?—F. O. R., Pawtucket, R. I.

The results F. O. R. obtained with the adapter indicate it is the circuit rather than the exact parts specified which count.

Any converter is a tricky affair and may present difficulties on some broadcast receivers. In many cases reversing the grid and screen grid connections will help. To those having difficulties Thomas A. Blanchard, 438 No. 9th St., Reading, Pa., the designer, offers to send free of charge a small blueprint giving another one-tube converter circuit. Send a stamped, addressed envelope.

ELECTRIFYING ANGLEWORMS

Is it possible to use electricity to make angleworms come out of the ground?—A. C., Oswego, New York.

Connect the ungrounded side of your 110 volt a.c. power line to a pointed iron stake, placing a 60 watt electric bulb in series with the stake. When this stake is inserted in earth containing angleworms and the current turned on, the worms should move out of the electrified territory in a hurry. Sprinkle ground with water if it is too dry to conduct electricity. Do not touch the iron stake when the current is on.

MAKING SCALE MODELS OF PLANES

I wish to build a quarter size model of a plane I have designed, to check the balance of the ship and make static weight tests. If dimensions of each part are reduced to one-fourth, will the weight of the scale be one-fourth that of the original?—C. O. Larson, Muskegon, Michigan.

In a true scale model every dimension would be reduced one-fourth. The result would be a model weighing 1/64th of the original, however. We know of no easy method of building scale models with weight also reduced proportionally.

CHANGING GENERATOR TO MOTOR

I changed a Model T Ford generator to a 110 volt a.c. motor according to the plan in the May M-M. The motor runs fine, with plenty of power, but gets so hot in a few minutes that I am afraid it will burn out. How can I keep it cool?—K. E. B., Geneseo, Illinois.

Some heat is unavoidable here. Eddy currents are set up since the pole pieces are not laminated. This motor is intended only for intermittent use on a bench grinder or polishing wheel. It should never be run for more than five minutes at a time.

Mount a fan on the armature and cut holes in the end plate to cool the field coils if you wish to use the motor for longer periods.

COLORING VENEER WOODS

Is there a simple method for coloring veneer woods for inlay effects in furniture?—A. T., Buffalo, New York.

Almost any kind of Easter egg dye may be used for coloring woods. Full directions will usually be found on the packets.

PERFORMERS SLEEP IN MOUSE CIRCUS

I built the mouse circus described in the Nov., 1933, M-M and it would be a howling success, except for the mice. I have 18 small dark mice I caught near home. They perform very nicely at night, but sleep all day when I want to show them off. Can you tell me what I am doing wrong? —D. A., South Dakota.

This mouse circus was really intended for white mice, whose sleeping habits more nearly correspond with those of human beings. Try shining a light on the mice all night to make them sleep, since they have a tendency now to sleep during daylight hours.

(Editor's Note—All letters sent to this department should include a stamped addressed envelope. Write to M-M Problems Editor, 529 So. 7th St., Minneapolis, Minn.)

ONLY JOHNSON GIVES YOU *Both*

THE only outboard motors in the world that give you ***Instant Pivot Reverse*** and ***Underwater Exhaust*** COMBINED are Johnson's two perfected Alternate Firing Twins. Built complete with Synchro Control, Propeller Protection Clutch, Rubber Mounted Steering Handle, Patented Co-Pilot, Rotary Valve, Vacuum Pressure Cooling. $140.00 and $160.00 f. o. b. factory. Other SEA-HORSE models as low as $85.00 f. o. b. (Prices subject to change.) Write for name of nearest dealer.

JOHNSON MOTOR CO. 200 Pershing Road, Waukegan, Ill.
Canadian Johnson Motor Co., Ltd., Peterboro, Canada

FREE!

Send for booklet on "Balanced Construction" and 1934 SEA-HORSE Handy Chart describing all new models and new features. Free.

JOHNSON SEA-HORSES

Become a Radio Expert

GOOD JOBS

Learn RADIO-TELEVISION ELECTRICITY-TALKING PICTURES

Times are getting better. Trained men are getting jobs. National will quickly train you to qualify for good jobs in all branches of radio, television, talking pictures, broadcasting, operating and general electricity. Thorough, practical training. Over $100,000 in modern equipment. National graduates in demand. Regardless of age or education you can learn profitable trades in a few months. Shop and studio practice.

QUALIFY AS A

Radio Repair Man
Television Expert
Control Operator
Station Technician
Sound Expert
Ship Operator
Broadcaster
Electrician
and many other jobs

EARN ROOM AND BOARD WHILE LEARNING

75% of our students earn living expenses while receiving training. We help you get a job. For limited time will allow your coach railroad fare to Los Angeles.

TRAIN IN LOS ANGELES

This is the Ideal City. Center of Greatest Activity in Radio, Talking Picture and Electricity. 30,000 successful graduates. School established 29 years. Send for free descriptive book and enrollment details.

NATIONAL RADIO & ELECTRICAL SCHOOL · Los Angeles

Dept. MMR-7, 4006 Figueroa St.,
Send Book and full details of Courses

NAME.....

ADDRESS.....

CITY.....STATE.....

Start $1260 to $2100 a Year

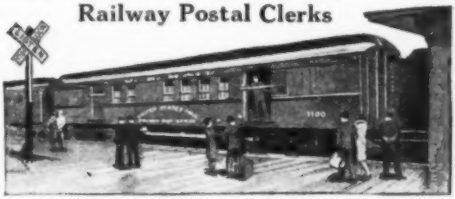
PICK YOUR FUTURE JOB

MEN, BOYS—18 to 50

Travel—See Your Country

Railway Postal Clerks get $1,900 the first year regular, being paid on the first and fifteenth of each month. ($79.17 each pay day.) Their pay is quickly increased in normal years, the maximum being $2,700 a year. ($112.50 each pay day.)

Railway Postal Clerks



3 Days On—3 Days Off—Full Pay

Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with a pension.

City Mail Carriers, Post Office Clerks

Clerks and Carriers now commence at $1,700 a year and in normal years automatically increase $100 a year to $2,100 and $2,300.

Customs and Immigrant Inspector

Salary $2,100 to $3,300. Men 21 to 45. Work connected with examining immigrants and merchandise entering the country from foreign parts.

Early examinations expected

Many early examinations are expected and those wishing positions should qualify at once.

Get Free List of Positions

Fill out the following coupon. Tear it off and mail it today—now, at once.

This investment may result in your getting a life big-paid government job.

FRANKLIN INSTITUTE, Dept. D-298, Rochester, N. Y.

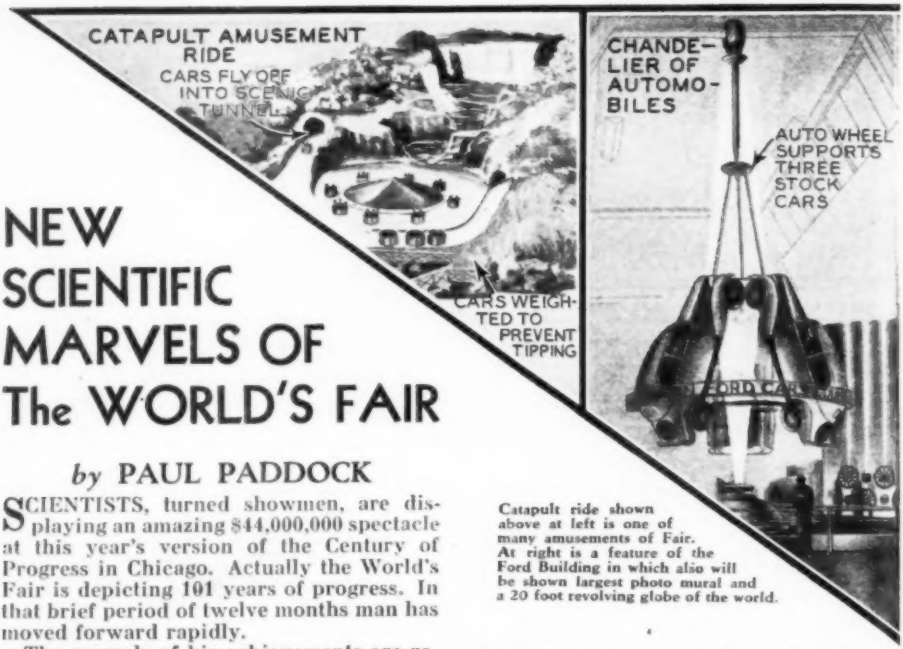
Rush to me entirely free of charge (1) a full description of the position checked below; (2) Free Copy of 32-page book, "How to Get a U. S. Government Job"; (3) A list of U. S. Government Jobs; (4) Tell me how to get a Government Job.

- ☐ Railway Postal Clerk ..... (Start $1900 year)
- ☐ Post Office Clerk ..... (Start 1700 year)
- ☐ City Mail Carrier ..... (Start 1700 year)
- ☐ Government Clerk—File Clerk ..... (Start 1260 year)
- ☐ Inspector of Customs ..... (Start 2100 year)
- ☐ Immigrant Inspector ..... (Start 2100 year)

Name .....

Address .....

Use This Coupon Before You Mislay It


CATAPULT AMUSEMENT RIDE
CARS FLY OFF INTO SCENIC TUNNEL
CARS WEIGHTED TO PREVENT TIPPING
CHANDELIER OF AUTOMOBILES
AUTO WHEEL SUPPORTS THREE STOCK CARS

Catapult ride shown above at left is one of many amusements of Fair. At right is a feature of the Ford Building in which also will be shown largest photo mural and a 20 foot revolving globe of the world.

NEW SCIENTIFIC MARVELS OF The WORLD'S FAIR

by PAUL PADDOCK

SCIENTISTS, turned showmen, are displaying an amazing $44,000,000 spectacle at this year's version of the Century of Progress in Chicago. Actually the World's Fair is depicting 101 years of progress. In that brief period of twelve months man has moved forward rapidly.

The marvels of his achievements are recorded in more than 100 new attractions in the second act of this great show. Except for a few outstanding buildings, the visitor will scarcely be able to recognize last year's fair. A new panorama of color, new buildings, a resplendent lighting system, original, thrilling, and amusing attractions, and a dramatic review of the world's latest accomplishments—all are combined in this mammoth exhibition on the shores of Lake Michigan.

From the world's largest fountain, jutting out 450 feet in the north lagoon, and the huge new Ford building to the simplest exhibit the entire fair sparkles with the swift march of science.

Spectacular Colored Fountain

The spectacular fountain is a huge bank of water illuminated by a giant "aurora borealis" of 40 searchlights playing a melody in five colors. The flow of water required is great enough to serve a city of 1,000,000 population.

Overwhelming in magnitude is the $1,500,000 Ford building. It is 900 feet long and occupies eleven acres of ground. Fourteen hundred tons of steel, 700,000 square feet of wall board, 1,600,000 feet of lumber, 5,000 yards of concrete, 160,000 square feet of tile flooring and 160,000 square feet of composition roofing have gone into the huge structure.

Outstanding feature of its interior decoration is the largest photo mural ever made, depicting the development of the motor industry. The mural, in effect a single photograph, is approximately 600 feet long and 20 feet high. What a comparison to the marvel of 1904, when the largest single photograph, 10 feet by two feet, was shown at the St. Louis exposition!

World's Largest Photo Mural

The mural, encircling the building's rotunda, requires seven-eighths of a mile of photographic paper, 40 inches wide. Nearly 200 pounds of paste were required for the mounting. Forty men worked a month to complete it. It consists of 97 panels, each weighing more than 400 pounds.

The photographs used were enlarged in a special enlarging machine, requiring 7,000 watts of brilliant light. The 8x10 inch originals were enlarged after midnight to insure steadier electrical current and less vibration from street traffic. The completed panels form seventeen scenes.

Dominant section of the Ford building is a great circular structure 210 feet in diameter rising in receding terraces to a height of 110 feet. It will house the "Drama of Transportation," an exhibit of passenger vehicles from the chariots of the Egyptians to the modern automobile.

Science building will again lure those interested in scientific developments. There "Wonder, the Robot" will perform approximately 5,000 movements with a mechanical brain and nervous system weighing 600

450 FEET LONG
FLOW OF WATER SUFFICIENT TO SERVE CITY OF 1,000,000 PERSONS
WORLD'S LARGEST FOUNTAIN
THE SKELETON TAP DANCER
SHAKES HANDS WITH VISITORS
MOTOR OPERATES WIRES TO BONES
WONDER ROBOT
BRAIN WEIGHS 600 LBS.
HAS 3000 PARTS
MONSTER AUTOMOBILE
STEERING WHEEL 7½' DIAM.
TIRES 12½' HIGH
80 FT. BODY HOUSES AUDITORIUM SEATING 80 PERSONS

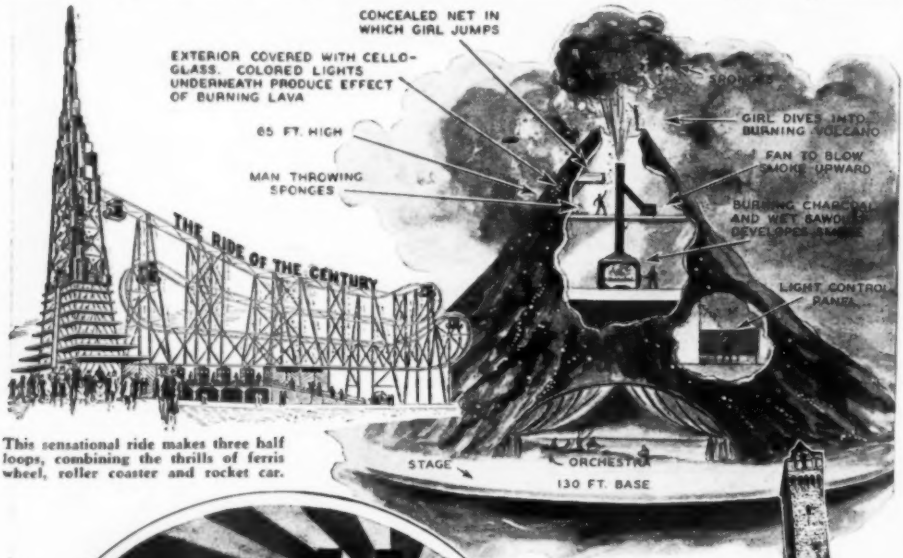
Fair's new water fountain, shown above, is illuminated by "aurora borealis" of 40 colored searchlights. The Tap Dancing Skeleton, above, will jig and shake hands. Wonder Robot, at right, can talk, smile and show emotions. His "nervous system" is controlled by steel tube (in right background) perforated with 4,500 tiny holes. Tube turning makes and breaks electrical contacts which operate the robot's lips, hands, and body not shown in the photograph.

pounds and containing 3,000 pieces. With a face composed of surgeon's rubber bandage material "Wonder" can realistically talk, smile, and express emotions. Robot's "nervous" system is a section of steel tubing perforated with 4,500 tiny holes. As the tube turns, the holes make and break electrical contacts which operate the robot's lips, hands, and other parts.

For those interested in amusing and thrilling rides and shows, the Midway, moved over to the island to allow space for the fair's many new villages, provides almost

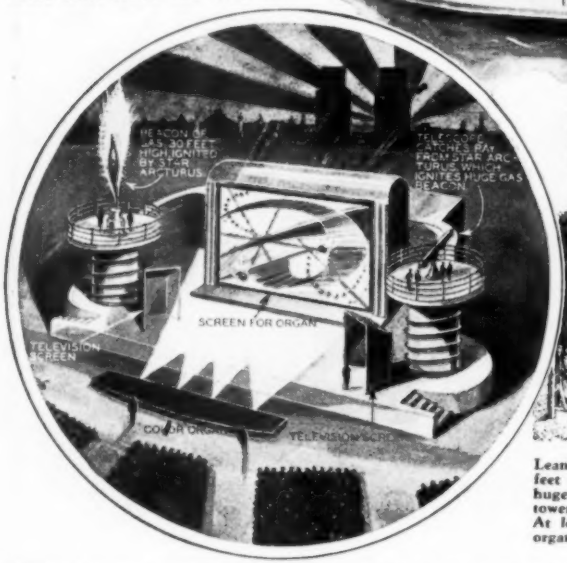
Largest auto model in the world, shown above, is on exhibition in the Great Hall of the Travel and Transport Building. It is 28 ft. high and has a windshield wiper a yard long. Inside the body sound movies of auto manufacturing will be shown. The running board of auto giant is 21 ft. long.

Many New Carnival Rides and Shows Feature 1934 Chicago Exposition


CONCEALED NET IN WHICH GIRL JUMPS
EXTERIOR COVERED WITH CELLO-GLASS. COLORED LIGHTS UNDERNEATH PRODUCE EFFECT OF BURNING LAVA
65 FT. HIGH
MAN THROWING SPONGES
GIRL DIVES INTO BURNING VOLCANO
FAN TO BLOW SMOKE UPWARD
LIGHT CONTROL PANEL
THE RIDE OF THE CENTURY
STAGE
ORCHESTRA
130 FT. BASE

This sensational ride makes three half loops, combining the thrills of ferris wheel, roller coaster and rocket car.

Girl dives into this synthetic volcano at the fair. Sponges, resembling rocks, pour from mouth of crater.



Leaning tower (above) in Italian village is 130 feet high and leans five feet out of line. Five huge pilings, sunk 75 feet into the earth under tower, safely hold structure in 100 m.p.h. wind. At left is new science theatre with large color organ and stage for daily scientific "circus."

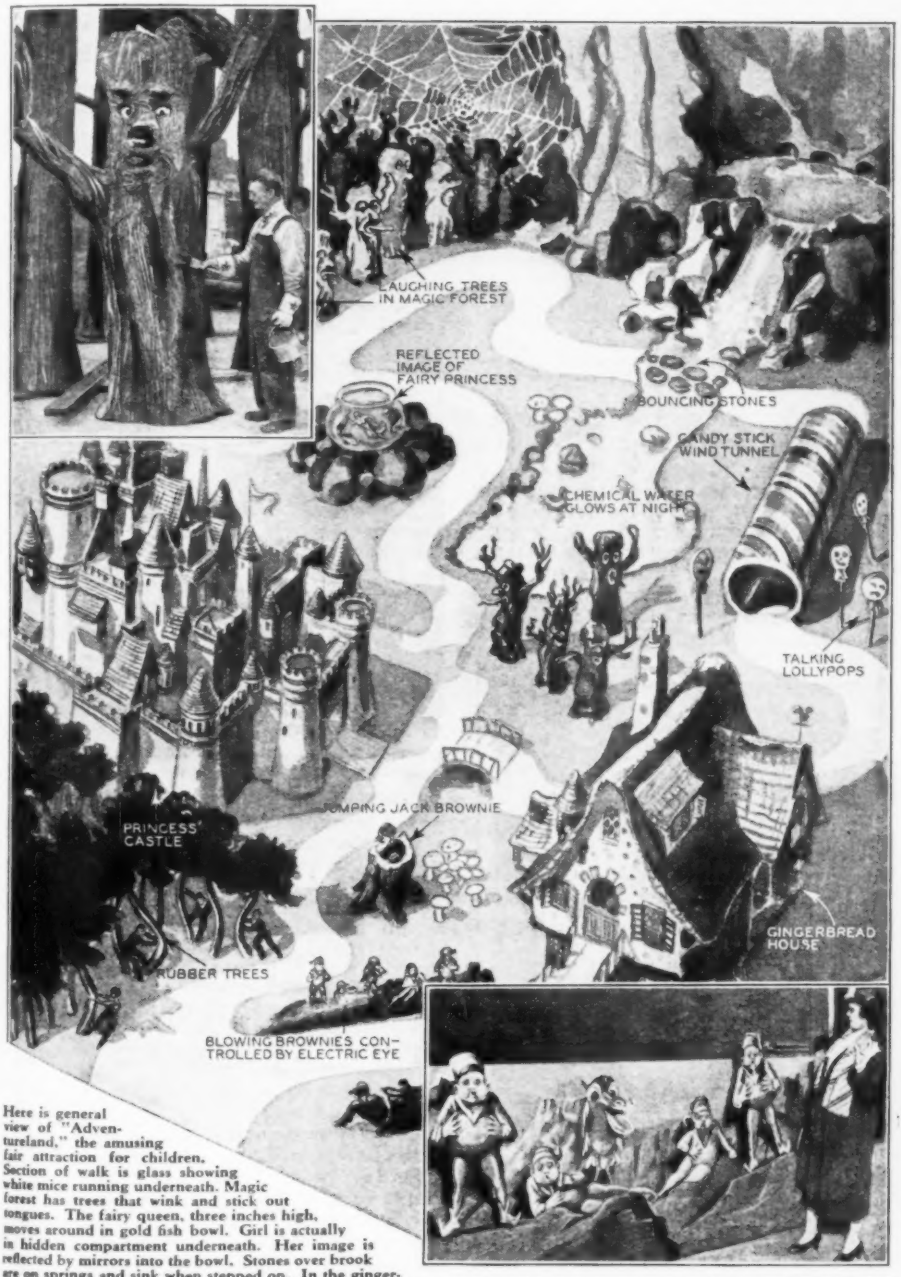
endless hours of fun. There is the whirling merry-go-round that catapults heavily weighted cars up an incline into a scenic tunnel. Another ride shoots cars down an incline. They make three sensational half loops before coming to a landing, combining the thrills of ferris wheel, coaster, and rocket car.

Outstanding amusement attraction is "Adventureland," an application of science and showmanship to the field of enchantment. There children will find themselves walking through a forest of laughing and winking trees, darting long tongues at the young visitors. A fairy queen, scarcely three inches high, will move about in a bowl swarming with live fish. The phenomenon is accomplished by means of mirrors that reflect into the bowl an image of a young lady performing her act in a hidden section underneath. A stick of candy wind tunnel, talking lollypops, jumping jack brownies, and blowing elves, operated by electric eye beams, are among the many features of this romantic playground.

Diners can enjoy their food at the fair while watching a beautiful Polynesian prin-

(Continued on page 143)

"Adventureland", Magic Fairy City, Is New Attraction for Children



Here is general view of "Adventureland," the amusing fair attraction for children. Section of walk is glass showing white mice running underneath. Magic forest has trees that wink and stick out tongues. The fairy queen, three inches high, moves around in gold fish bowl. Girl is actually in hidden compartment underneath. Her image is reflected by mirrors into the bowl. Stones over brook are on springs and sink when stepped on. In the gingerbread house the floor is tipped at a steep angle but scenery is arranged to make room appear level. The jumping jack brownie, made of rubber, is blown up by air tank operated when electric eye beam is broken by passing children. Blowing elves, shown in photo at lower right, also release air by means of photoelectric cells. The rubber trees are made from auto casings and can be bent by young visitors without danger. The playground has a path 425 feet long with an adventure every 25 feet. Park is illuminated at night when the lake glows brightly by means of chemically treated water.

Musicians Present Beethoven in Dishpan Symphony

Photo shows a critical moment in rehearsal as Dr. Frederick Stock, left, director of the orchestra, appraises the tone of a frying pan in the hands of a symphony player.

CLASSIC musicians yielded to the influence of Tin Pan Alley in a novel concert recently staged by the Chicago Symphony Orchestra to celebrate the raising of a deficit fund.

Under the direction of Dr. Frederick Stock, leader of the orchestra, all of the members of the percussion section were equipped with pots, pans and other miscellaneous kitchen utensils in preparation for the playing of Beethoven's Symphony No. 8. Much time was expended in testing the various makeshift instruments to secure the proper tone quality during rehearsal periods.

Fan Builds Stovepipe Telescope

USING a section of stovepipe for a tube, Arnold Oswald, Los Angeles amateur astronomer, has constructed a remarkably efficient reflecting telescope at a surprisingly low construction cost.

The total expense of constructing the stovepipe instrument, including the pipe, lens, reflector, tripod, counterbalance and other accessories, was slightly more than ten dollars, according to its builder.

The builder of the stovepipe telescope makes needy adjustments as he initiates his sister into stargazing mysteries.

Machine Knits Socks by the Yard

Inspectors examine a string of socks as they leave the machine. Cut apart, the socks are ready for the market.

SOCKS by the yard for the English foot are being turned out by a new machine whose finished product is not unlike a length of link sausage.

Speedy in operation, the knitting machine turns out the hose in a continuous length. The socks only require cutting apart before being packaged and put on the market.

Potato Parer Proves Time Saver

DESIGNED to conform to the general curve of the fruit or vegetable to be peeled, a new paring knife operates in half the time required with a straight tool.

The knife may also be used as a coring device if desired.

Photo shows how knife clings to curve of vegetable to be pared.

CLUBS *in* 8 *States Seek* CHARTERS *in* MM'S *World-wide Workshop* SOCIETY

NOTED AUTHOR CONGRATULATES ORGANIZATION FOR SHOP FANS

"Congratulations on the establishment of the 'International Society of Modern Mechanix and Inventors.' If 'lone' members are in order, I hereby apply for membership.

A. Neely Hall."

(Well-known magazine and newspaper workshop editor, author of "The Boy Craftsman," founder of The Boy Craftsman League, and Counselor in Handicraft of the National Council, Boy Scouts of America.)

CLUB NO. 2 of the International Society of Modern Mechanix and Inventors was organized in Chicago. It is called the Skekagong Amateur Camera Club. The five members are shown in the upper photograph. Below are the officers, H. R. Curtis, (left), president, and William Collins, secretary, looking over the equipment of a darkroom of one of the club members.

JUST one of many letters of congratulations on the formation of the International Society of Modern Mechanix and Inventors is quoted above. Announcement of the new organization in the June issue of MODERN MECHANIX AND INVENTIONS was followed by a flood of applications for charters.

Charter Club No. 2 was formed in Chicago and has adopted the name of the "Skekagong Amateur Camera Club," after the original Indian term for Chicago. Eight states were represented in the first group of applications received. Organization of clubs in these states under rules of the society is now under way and their charter numbers will probably be announced next month.

As announced in the last issue any group of five or more persons, interested in any sphere of activity covered in MODERN MECHANIX AND INVENTIONS, can form a club and apply for a charter in the International Society of Modern Mechanix and Inventors. No limit is placed on the number of clubs formed in one city. Headquarters of the Society will willingly put prospective members in touch with the local clubs in their cities.

The Society levies no dues of any kind, although membership is limited to subscribers to MODERN MECHANIX AND INVENTIONS, the official organ of the I.S.O.M.M.I.

Anyone interested in home workshop activities, science, mechanics, or inventions can organize a club. If you are thinking of forming a club, call a meeting of five or more friends, elect officers and send for an application blank for a charter. Address requests for application blanks to the International Society of Modern Mechanix and Inventors, care of MODERN MECHANIX AND INVENTIONS, 529 South Seventh Street, Minneapolis, Minn.

Formation of clubs and activities of the member groups of the Society will be reported in the official magazine, MODERN MECHANIX AND INVENTIONS. From time to time the magazine will sponsor contests for Society members only

Regular members of the Society will be able to obtain subscriptions to the official magazine, MODERN MECHANIX AND INVENTIONS, at a discount from the usual subscription rate. Workshop blueprints, published by MODERN MECHANIX AND INVENTIONS, can also be obtained by club members at a discount.

As soon as your club is organized send photographs to headquarters of the Society. A picture of your group in its meeting place and another view of the officers can be sent in with the request for an application blank.

The International Society of Modern Mechanix and Inventors was formed after the Nokomis Artisans Club of Minneapolis came to the publishers of MODERN MECHANIX AND INVENTIONS and asked that the magazine sponsor such an organization.

Radio Power will Revolutionize

Tesla's World of Tomorrow

"We are on the threshold of a gigantic revolution, based on the commercialization of the wireless transmission of power.

"Motion pictures will be flashed across limitless spaces . . .

"The same energy (wireless transmission of power) will drive airplanes and dirigibles from one central base.

". . . In rocket-propelled machines . . . it will be practicable to attain speeds of nearly a mile a second (3600 m.p.h.) through the rarefied medium above the stratosphere.

". . . We will be enabled to illuminate the whole sky at night . . . Eventually we will flash power in virtually unlimited amounts to planets."

—Nikola Tesla.

Nikola Tesla, electrical wizard, foresees the day when airplanes will be operated by radio-transmitted power supplied by ground stations, as shown in the drawing above.

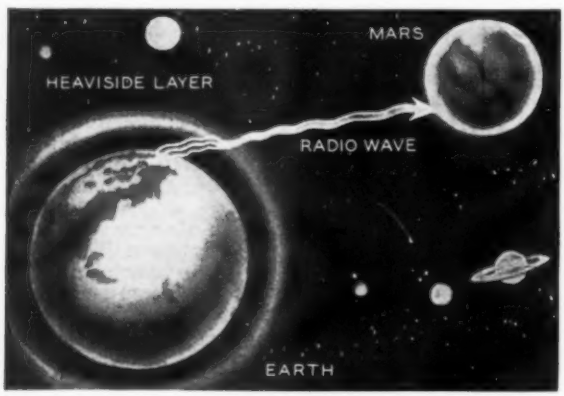
THE world will soon enjoy the benefits of electricity transmitted by radio. Huge and expensive transmission lines will be unnecessary. Bulky and unsightly distribution systems will be done away with. A little receiving device in your home will give you all the power you can use—and for only a fraction of present-day costs.

We will soon be communicating with other planets, where it is entirely possible that there is civilization far ahead of ours.

Tomorrow we will see rocket planes flying through stratosphere at a speed of a mile a second or 3600 miles an hour.

Fanciful dreams? No! Just conclusions based upon knowledge of what has been done, what is being done and what can be done in the future. I speak along practical lines and with a practical knowledge of what I am talking about.

Power transmission by radio is going to change our present civilization materially. The transmission of energy to another planet is now only a matter of engineering. I have solved the problem so well I no longer regard it as doubtful. I am also certain there are creatures on other planets whose ways are like ours. The new era will see amazing developments in interplanetary relations.



By using ultra-short waves, science expects to penetrate the heaviside layer, or gaseous medium surrounding the earth, and establish radio communication with Mars and other distant planets, as shown in drawing above.

Every other planet has to pass through the same phase of existence this earth did, and life is started on them during that favorable phase by the rays of some sun. It develops in the presence of moisture, heat and light in much the same manner as life does here. We know that light propagates in straight lines, and consequently our perceptions of the forms through the images projected on the retina must be true.

Therefore, it should not be hard to establish intelligent exchange of ideas between two

the WORLD

by **NIKOLA TESLA**
As told to
ALFRED ALBELLI

Who Is Tesla?

Radio Pioneer Nikola Tesla was born in Hungary, came to the United States in 1884 and has since developed more than 100 devices and improvements in electrical technology.

Once associated with the late Thomas A. Edison, Tesla sent a radio impulse around the world almost 40 years ago. He discovered the rotating field principle in alternating currents and is considered one of the greatest living electrical scientists and radio authorities.

Nikola Tesla is shown in his laboratory with late type mercury arc rectifier tubes. When operating, these tubes give off a violet glow.

planets. The earth we inhabit might be the beneficiary. It is conceivable that there is civilization on other planets far ahead of ours. If communication could be established by the earth the benefits to human beings would be incalculable.

As far back as June, 1900, in discussing my experiments at the beginning of the century, I said that my measurements and calculations showed that it was perfectly practicable to produce on our globe an electrical movement of such magnitude that, without the slightest doubt, its effect would be perceptible on some of our nearer planets, as Venus and Mars.

Interplanetary Communication Probable

Thus, from mere possibility, interplanetary communication has entered the stage of probability. In fact, that we can produce a distinct effect on one of these planets in this novel manner, namely, by disturbing the electrical condition of the earth, is beyond any doubt.

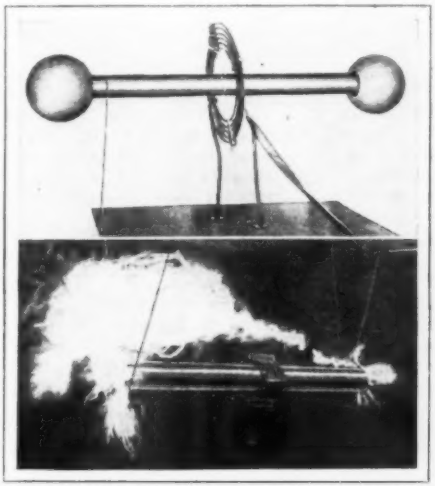
In order to make myself clearer I shall delve still further into the preliminary discoveries made in what I call my pioneering days, which was long before any other scientist had made any progress in this field. I have always chosen to remain in the background.

Some years ago I urged the experts engaged in the commercial application of the wireless art to employ very short waves, but for a long time my suggestions were not heeded. Eventually, though, this was done, and gradually the wave lengths were reduced to but a few meters.

Invariably it was found that these waves, just as those in the air, follow the curvature of the earth and bend around obstacles, a peculiarity exhibited to a much lesser degree by transverse vibrations in a solid.

Recently, however, ultra-short waves have been experimented with and the fact that they also have that same property was hailed as a great discovery, offering the stupendous promise of making wireless transmission infinitely simpler and cheaper.

It is of interest to know what wireless



Top photo shows the famous Tesla coil, used to transmit early radio signals. Below, the coil in actual operation.

Rocket Ships to Circle Globe in 5½ Hours; Night to Change Into Day

Future rocket planes may circle the globe in 5½ hours. At 3600 m.p.h., the plane travels about 19,500 miles. Earth's rotation adds 5500 miles to total. Right, lights directed against giant reflectors may furnish constant daylight in future, if radio-power projects prove successful.

experts have expected, knowing that waves a few meters long are transmitted clear to the antipodes. Is there any reason that they should behave radically different when their length is reduced to about half of one meter?

As the knowledge of this subject seems very limited, I may state that even waves only one or two millimeters long, which I produced thirty-four years ago, provided that they carry sufficient energy, can be transmitted around the globe. This is not so much due to refraction and reflection as to the properties of a gaseous medium and certain peculiar action.

Short Waves Provide Increased Channels

The chief object of employing very short waves is to provide an increased number of channels required to satisfy the ever-growing demand for radio appliances. But this is only because the transmitting and receiving apparatus, as generally employed, is ill-conceived and not well adapted for selection.

Because of this and other shortcomings, I do not attach much importance to the employment of waves which are now being experimented with. Besides, I am contemplating the use of another principle which I have discovered and which is almost unlimited in the number of channels and in the energy three-electrode tubes.

This invention has been credited to others, but as a matter of fact it was brought out by me in 1892, the principle being transmitted.

It should enable us to obtain many important results heretofore considered impossible. With the knowledge of the facts before me, I do not think it hazardous to predict that we will be enabled to illuminate the whole sky at night and that eventually we will flash power in virtually unlimited amounts to planets.

I would not be surprised at all if an experiment to transmit thousands of horsepower to the moon by this new method were made in a few years from now. We must establish transmission of power in all its innumerable applications. This has been my life work, and although I am now close to 78, I unhesitatingly say that I hope to see its fruition.

I have been fortunate in the evolution of new ideas, and the thought that a number of them will be remembered by posterity makes me happy indeed. I am confident

(Continued on page 117)

What About Today's Scientists?

"The scientists from Franklin to Morse were clear thinkers and did not produce erroneous theories. The scientists of today think deeply instead of clearly. One must be sane to think clearly, but one can think deeply and be quite insane.

"Today's scientists have substituted mathematics for experiments and they wander off through equation after equation and eventually build a structure which has no relation to reality."

—Nikola Tesla.

Manpower Flight Greatest April Fool Joke

PHOTOGRAPHS of a man flying through the air by his own power, the dream of scientists for centuries, completely fooled outstanding U. S. newspapers recently.

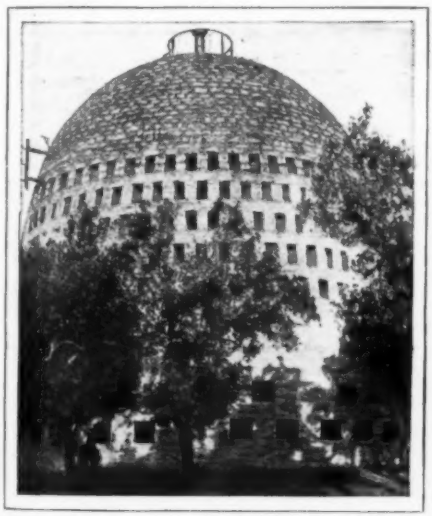
Captions on the photographs, coming from Germany, explained that Pilot Erich Kocher took off with a pair of rotor wings strapped to his chest. Kocher supposedly blew into a box which converted the carbon dioxide of his breath into fuel to operate the rotors. The turning rotors developed a vacuum ahead pulling the man through the air.

Newspaper editors failed to note several important angles that would have revealed the hoax. No cable story had appeared previously describing what would have been one of the greatest achievements of science. The pilot's name Kocher was from the German "Keucher," meaning "hot air merchant." Carbon dioxide is not a combustible gas.

The great hoax originated in the Berliner Illustrirte Zeitung, editors of which faked the pictures for the magazine's April Fool edition.

This picture, captioned "Man flies under own power for first time," fooled newspaper editors throughout country. Photo of flying man was pasted over view of airport.

Big Bee-hive Gets Water From Air



Bee-hive like drinking fountain near shores of Mediterranean catches water from the air, collects it on thousands of slate slabs inside. Solid rock roof is 14 feet thick.

AN ODD "drinking water fountain" in Europe acts as a giant artificial spring, condensing the moisture of the air.

The thick brick walls keep the inside of the stone structure at a lower temperature than the outside, so that moisture condenses on the thousands of stone slates.

Racer Has Diamond Bearings

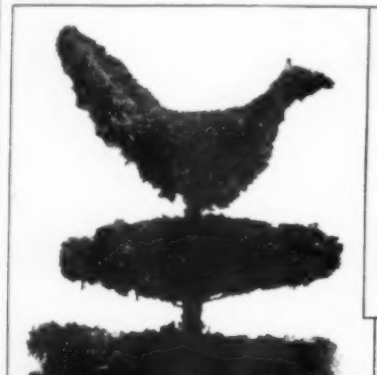
DIAMOND bearings costing over $1000 are just one of the reasons why the speed record for midget racing cars has been brought back to this country by Kenneth L. Moorehouse.

Moorehouse spent over $9000 in developing and building his speedy racer, just to wrest the record from English racers.

The car weighs less than 1,000 pounds. It can do 130 miles per hour.

Kenneth L. Moorehouse, holder of midget car racing record of 130 m.p.h., demonstrates his $9,000 car on observation platform of Empire State Building, 86 stories above street.

Gardener Creates Novel Treetop Menagerie



Not a real pointer, but a cleverly designed shrubbery dog.

One of the features of the curiously sheared red cedar trees which form the odd zoo "garden" of V. J. Prucha, Crete, Nebraska, is the peacock shown roosting proudly above. Right—an amazingly lifelike reproduction of an elephant, shaped by careful trimming of the living tree by the artist-gardener.

Photo shows the tree sculptor and his wife with a garden model of the famous Paul Revere.

This camel is up a tree—another of the odd and unusual animals which populate Mr. Prucha's unique treetop menagerie.

Scientist RESTORES *LIFE of Dead Dog*

BRINGING a dog back from death and keeping him alive for several weeks has been successfully accomplished by Dr. Robert Cornish of the University of California and his research assistants.

These men watched day and night over "Thirteen," the mongrel fox terrier used for the experiment, after putting him to death with nitrogen anaesthetic on April 13.

The miracle of restored life was brought about four minutes after death by injections of adrenalin, dog's blood, and heparin, together with special respiratory treatments. Less than half an hour after heart action was restored the dog barked feebly.

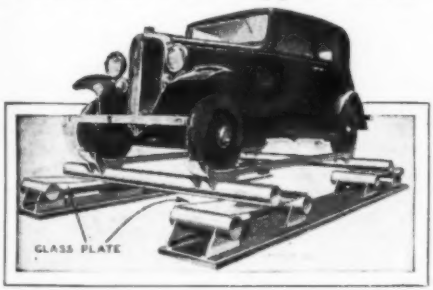
A terrific rate of heart action threatened to bring "Thirteen's" second life to an early end, but injections of gum arabic tided the dog over the crisis.

The animal displayed hunger and thirst, and raised his head when anyone entered the room, but his actions more resembled those of a creature neither dead nor alive. Dr. Cornish is certain some of the dog's brain cells have not completely recovered from the shock of death.

On the 17th day of his second life "Thirteen" caught a head cold which for a time doctors feared might complicate his condition.

"Thirteen," the dog who was brought back to life after death by gas, was fed with a bottle until able to eat meat. Photo shows Dr. Cornish who conducted experiment.

New Plate Glass Supports Auto



New plate glass supported between steel cylinders holds up heavy touring car easily. It is ideal for automobile windows, since it is strong and practically shatterproof.

AN ENTIRELY new plate glass, developed in Europe and now being manufactured in this country, is believed to be the strongest glass ever made.

In tests one thickness of the glass supported a heavy touring car. The glass is practically shatterproof. Should a piece of it be broken by an exceedingly heavy blow, it crumbles into dust, leaving no sharp splinters to cause injury.

The new plate glass will be extensively used for automobiles and in other places where strength is required.

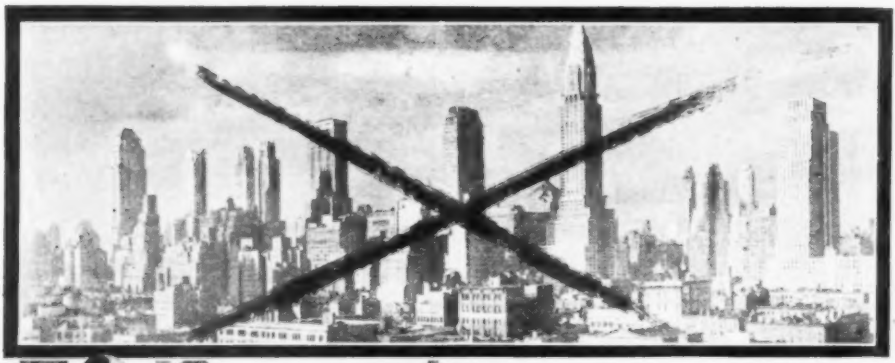
Chops Wood With Steel Hands

DELICATE but powerful are the steel hands made by Andrew A. Gawley and his blind father. Though both arms were amputated thirty-two years ago in an accident, Gawley has learned to use his artificial arms to such an extent that today he earns his own living as a machinist.

He can dress himself, tie his shoe laces, use a knife and fork skillfully, and even break stones with his powerful hands. Wood chopping is easy for him, for his steel fingers grip tighter than human fingers.

Left: Andrew A. Gawley, known as "The man with the steel hands," ties own shoe laces with mechanical fingers. Right: Steel fingers grip ax firmly when chopping wood.

SKYSCRAPERS DOOMED



The doom of Manhattan's towering skyline, above, may be sounded by the centrifuge, left, below. Construction models placed in this machine are whirled about until centrifugal force equals the pressure to which the full-size buildings are subjected by earth in actual sub-surface conditions.

by WILLIAM JENNINGS

SAFE from bomb attacks—free from disease and changing temperatures—living in cities a mile beneath the surface of the earth—such is the dream of science for the man of the future, a not impractical dream which may doom the towers of Manhattan and every other large city to destruction.

Despite its towering skyline, the trend of building construction in New York City has been ever downward. Today the island of Manhattan and its surroundings are honeycombed with a vast network of underground facilities. There are more than 130 tunnels and underground areas in the metropolitan district; more than 2800 miles in the subterranean sewage system, and about 600 miles of subway trackage carrying 5,000,000 passengers every day.

With habitable space growing more scarce every year in the crowded centers, architects and scientists freely predict that vertical cities, built from the earth's surface downward, may eventually supplant the skyscrapers of today.

The reasons for their belief in the practicability of such a plan lies in the recent successful tests of a machine known as the "centrifuge" invented by Professor Philip B. Bucky, of Columbia university.

Explained in its most simple terms, Professor Bucky's machine is a device into which accurate scale models of underground structures may be placed and whirled about in such a way that the centrifugal force equals the actual earth stress to which full sized construction would be subjected.

Built of the same materials as the structure to be tested, the model is placed on the centrifuge and whirled at speeds up to 4000 revolutions a minute until the centrifugal force tends to pull the model apart.

A movie camera simultaneously records each revolution of the machine. When the film is run off on the screen it shows up the stress and strain under varying degrees of force up to the collapse of the model.

Heralds New Building Era

From these technical tests a new science of foundation engineering is expected to develop. Lack of a yardstick with which to measure the stresses of the earth has hitherto kept architects from planning extensive underground projects.

Testing depths up to 6000 feet, the centrifuge opens up an amazing vista of life in the future. It will be possible to have business blocks under airports with the

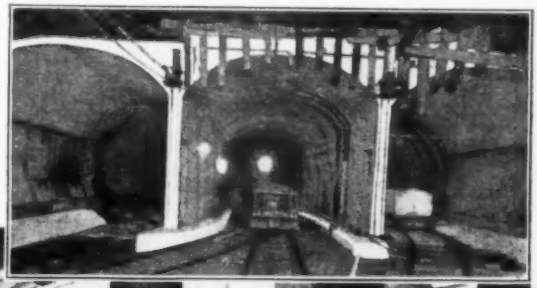
by UNDERGROUND CITIES?

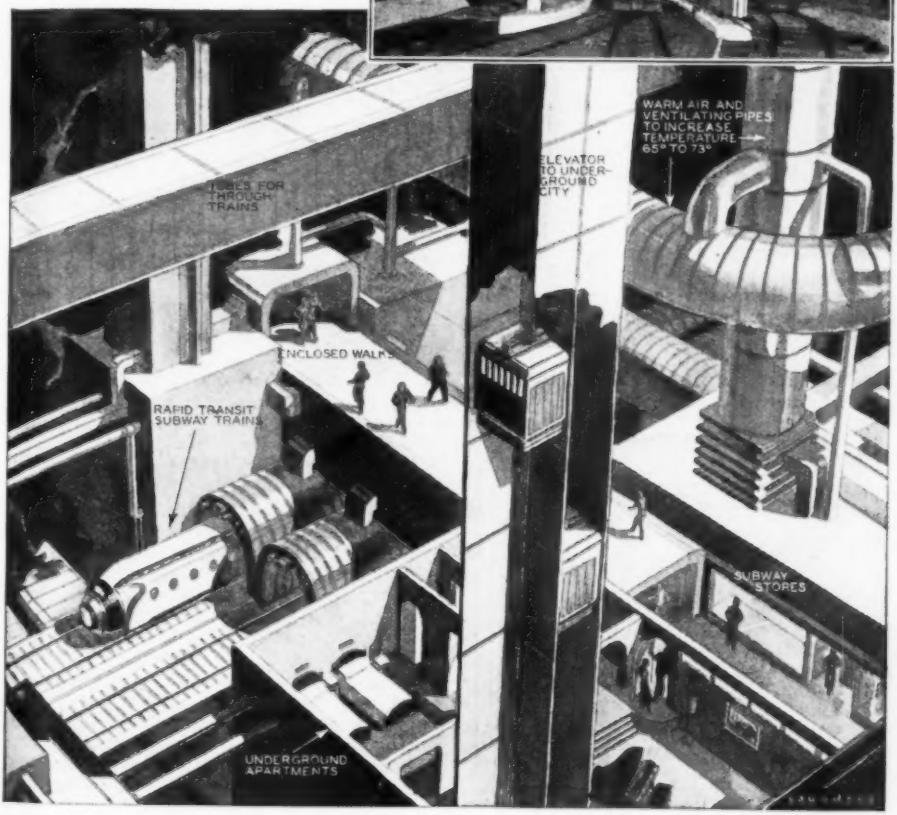
surface left clear for planes. Vast subterranean caverns could be constructed, capable of sheltering entire populations against enemy bomb attacks. Office buildings, factories, homes and theaters—all could be sunk into bedrock.

Life underground would be different only in the respect that conditions, under scientific control, would be more sanitary and healthful. Conditioned air would prevail and the sun's absence compensated for by the use of ultra-violet lamps. The temperature would be constant at about 62 degrees. Coal bills would no longer worry the householder and bacteria would be killed.

Professor Bucky does not venture to make extravagant predictions. His centrifuge does not construct; it merely tests. The advantage of the machine lies in the fact that the safety of underground buildings may be absolutely proven by testing miniature models.

Photo at right shows one of the three-tube subway tunnels, part of the vast network underlying New York City. This picture is a possible forerunner of the future underground city shown below. Note elevator shafts which will carry city cave dwellers from one level to another, the giant air conditioning tubes and the enclosed roadway, leading from left to right, for through traffic. Lower part of drawing shows an underground apartment fronting on a street lined with stores and shops furnishing all necessities.




TUBES FOR THROUGH TRAINS
ENCLOSED WALKS
RAPID TRANSIT SUBWAY TRAINS
UNDERGROUND APARTMENTS
ELEVATOR TO UNDERGROUND CITY
WARM AIR AND VENTILATING PIPES TO INCREASE TEMPERATURE 65° TO 73°
SUBWAY STORES

Cyclists Maneuver Galloping Bikes in Novel Polo Match

Managing unruly "galloping bike" and at same time knocking ball across goal line proved difficult for this polo player.

A POLO game is seldom dull, but when galloping bicycles are substituted for the traditional steeds, the fun begins.

A polo match on bicycles was a feature of a recent cycling meet at Herne Hill, London, England.

Spills were frequent as riders literally tossed their cycles about the course in pursuit of the elusive white ball.

The elongated "croquet" mallets proved rather dangerous weapons as they were swung wildly about in the faster scrimmages. Riders chose to wear "crash" helmets just in case things should get rough.

Lamps to Hold Stratosphere Air

GIANT electric light bulbs of the 10,000 watt size will reach a new "high" this summer, when Captain Albert W. Stevens carries a number of them in his balloon as he ascends into the stratosphere.

These glass globes will be used as air sampling containers. Special valves will be built into the bulbs before they are pumped out to an almost perfect vacuum. Samples of air at various elevations in the stratosphere can thus be brought back to earth and subjected to chemical analysis by the United States Bureau of Standards, for the glass globes will not leak air.

Captain Stevens, center, with General Electric lamp engineers examine 10,000 watt light globe to be used in obtaining samples of stratosphere air at various levels this summer.

Consumer Clears Room of Smoke

CLEARING rooms of smoke and undesirable odors is a simple task with a new smoke-consuming device.

The appliance burns pure wood alcohol and is said to clear the smokiest room within ten minutes.

This appliance burns wood alcohol to clear the room of smoke or any other disagreeable odors.

Vest Pocket Plane Is Low-priced

Knight Twister, new vest pocket plane, snuggles nicely under wing of ordinary monoplane. Tiny ship makes 40 mi. per gal. of gas, cruises at 120 m.p.h., lands at 38 m.p.h.

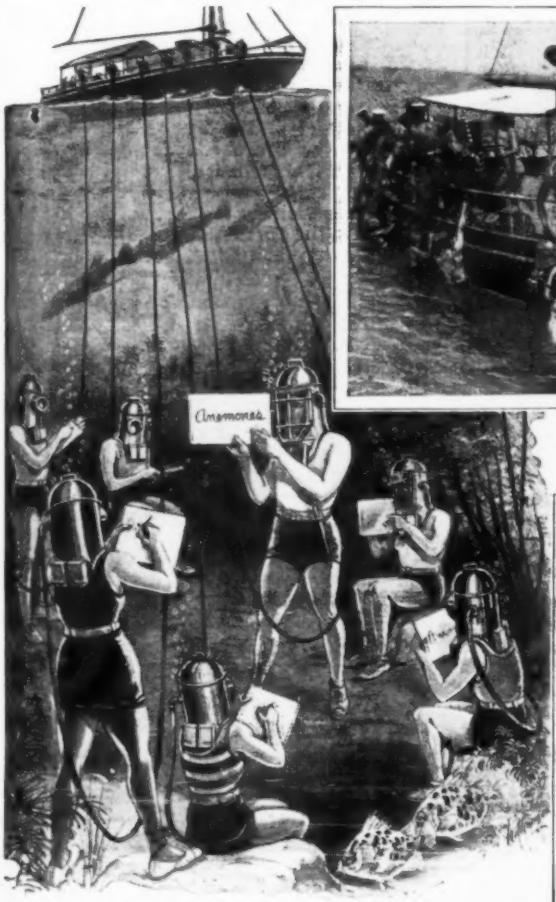
A TINY biplane which easily snuggles under the wings of any ordinary plane has been designed to fill the demand for a low-priced light plane which combines safety with economy.

This midget plane, known as the Knight Twister, can cruise for 4 hours at 120 m.p.h. on its gas supply. It uses but 3 gallons of fuel per hour, giving the surprising mileage figures of 40 miles per gallon of gasoline.

The landing speed is 38 m.p.h., the plane rolling but 125 ft. after touching the ground. The upper wing is 15 feet wide, and the overall length 11 ft. The craft weighs 400 lbs., and can carry a load of 250 lbs.

Undersea Classroom Reveals Ocean Secrets

Photo shows student divers about to descend to their under sea classroom, fifty feet below the surface. The deck crew maintains the oxygen supply.



Above, an artist's conception of the under sea classroom in session. Writing upon a zinc plate with a yellow wax crayon, the instructor comments briefly as the students take notes with similar equipment. Right, a fair coed receives preliminary diving instruction at a Miami beach before venturing out to deeper levels. The helmet shown weighs about 70 lbs.

DOWN among the coral reefs off the Florida coast lies the world's strangest college laboratory—the under sea classroom of the marine zoology department of the University of Miami.

Clad in bathing suits, the class sails to the laboratory site, dons diving helmets and sinks into the sea, as assistants on the boat above send fresh supplies of oxygen pulsing through the air tubes.

Fifty feet below the surface the actual class work begins, once the students have become acclimated to their shadowy surroundings. Strange fish swim into their range of vision. Curious marine growths cling to the jagged coral. The tropic waters teem with mollusks, star fish, sea fans, breathing sponges, and trigger fish—an endless variety of marine life.

As these under sea wonders are revealed to the students' eyes, the instructor comments upon the life about them, writing on a zinc tablet with a yellow wax crayon. Similarly equipped, each student takes notes as the lecture progresses, later transcribing the laboratory notes into a permanent record.

The under sea work is not an experimental fancy, but a regular part of the university's zoology course.

Tin Clad Knight Stands Guard Duty Over Parking Lot

Photo shows a car park attendant at Bearsted, in Kent, England, in his working clothes—a suit of knightly armor.

COMPLETELY encased in glittering armor from his helmeted head to his tin clad toes, an English car park attendant is furnishing a quaintly medieval note to a distinctly modern scene.

Daily he stands guard over the automobiles parked at the Tudor House in the Kentish town of Bearsted, moving cumbersomely about his duties, clad in his unusual costume.

Tourists visiting the district for the first time have the curious feeling that the pages of history are being turned backward.

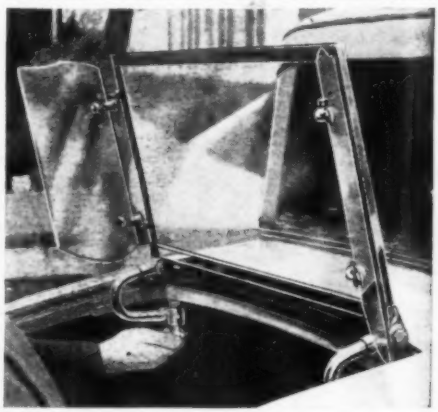
Heat Coils Knee-action Springs

INTENSE heat plays an important part in a new method for coiling knee-action springs recently perfected by the Buick Motor Company.

A bar of silicon manganese steel is first flattened between rollers and then heated to a temperature of 1560 degrees Fahrenheit. The spring is then coiled on a mandrel, guided by a spiral lead screw, stripped from the mandrel, reheated for hardening at 1610 degrees and removed for quenching in oil and cold water.

Heated more than 1500 degrees, a bar of silicon manganese steel is being coiled on a mandrel by Buick workmen, one step in the manufacture of the popular knee-action springs.

Rumble Windshield Disappears



Comfort for rumble seat riders is embodied in this windshield which may be lowered to floor if passengers wish.

BY MEANS of a controlling knob, a new rumble seat windshield may be swung down to rest on rubber pads in front of the passengers' feet. Ample leg room is provided.

New Paint Roller Mottles Walls

DECORATING walls is a simple task for both layman and professional with a new mottling tool now on the market.

Made of leather, the paint roller is available in three sizes, from 5 to 10 inches long and is said not to clog. Two or more colors may be applied.

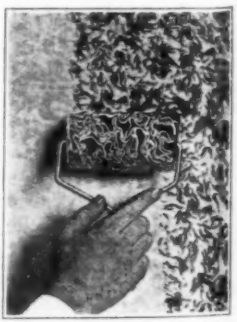


Photo shows how mottled designs are applied with roller.

Burner Using Any Fuel Oil Perfected by Blind Inventor

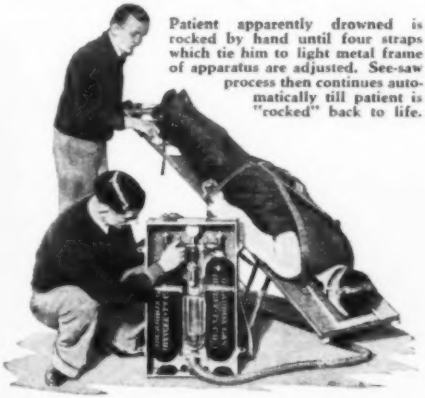
DESPITE the fact that he has been blind for sixteen years, a persevering inventor has recently completed a successful oil burner which uses all types of fuel oil.

The burner is a vertical type with an air blade for every oil outlet. The device is controlled by a thermostat but has an idling spray which goes into operation when the set temperature has been reached.

The invention is the result of two years of work and experimentation.

Photograph shows William Patnaude, blind inventor, with a model of his successful oil burner. The machine was perfected after two years' work. It will burn all types of fuel oil and has proven unusually efficient in tests.

See-Saw Rocks Dead Back to Life



Patient apparently drowned is rocked by hand until four straps which tie him to light metal frame of apparatus are adjusted. See-saw process then continues automatically till patient is "rocked" back to life.

PERSONS apparently drowned can be "rocked" back to life by a new artificial resuscitation apparatus being installed in hospitals all over England.

The machine produces 10 to 15 see-saw motions a minute to induce an exact imitation of natural breathing. It work automatically once the patient is balanced on the light metal frame.

Penny Brush Has Powder, Too

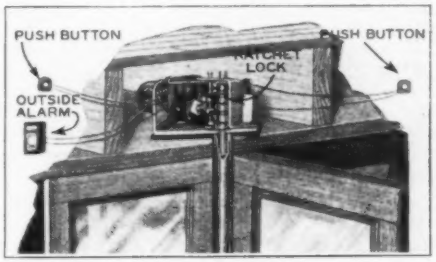
Penny toothbrush with powder in pad comes five to envelope. Used once, then thrown away, they are ideal for travelers and guests.

THE penny toothbrush is here. A Hollywood dentist has designed a new type of brush to be put up in packets of five in a sealed glassine container. The compressed cotton top, with ridges to simulate bristles, is covered with a film of dental powder. Brush is ready to use.

Novel Door Lock Stops Gangsters

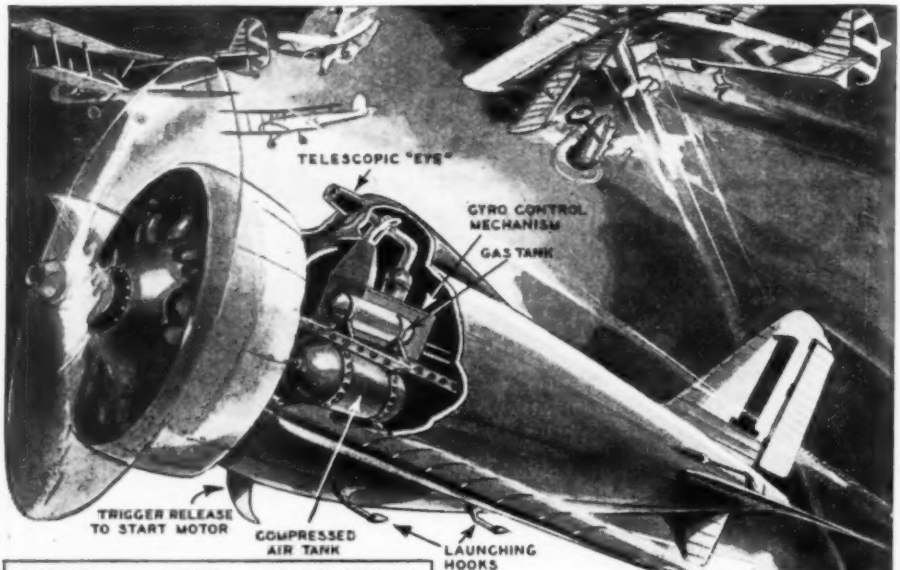
AN AUTOMATIC electric clock built for revolving doors such as are used in banks and department stores was designed by three Minneapolis inventors to thwart gangster attempts at wholesale robbery.

The device is concealed in the wall just above the axis of the door. In case of a holdup any employee can press the alarm push button. A small electric motor immediately engages notched clutches which prevent the door from turning.



Push buttons located throughout bank set off alarm, start motor which engages locking cams of revolving doors. Robbers are trapped in building until police operate switch.

ROBOT *Planes to* FIGHT



This is the way the robot planes, designed to use the Brown invention, will look when finally completed and ready for actual tests sometime during the coming year.

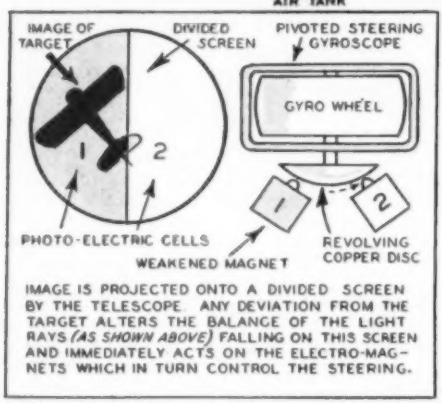


IMAGE OF TARGET
DIVIDED SCREEN
PIVOTED STEERING GYROSCOPE
GYRO WHEEL
1
2
PHOTO-ELECTRIC CELLS
WEAKENED MAGNET
REVOLVING COPPER DISC
IMAGE IS PROJECTED ONTO A DIVIDED SCREEN BY THE TELESCOPE. ANY DEVIATION FROM THE TARGET ALTERS THE BALANCE OF THE LIGHT RAYS *(AS SHOWN ABOVE)* FALLING ON THIS SCREEN AND IMMEDIATELY ACTS ON THE ELECTRO-MAGNETS WHICH IN TURN CONTROL THE STEERING.

A telescope on the interceptor plane is focused on a divided field. The off course side weakens a current controlling the gyro steerer, bringing the ship on its course again.

WINGING their way with deadly precision towards the apparently unsuspecting city which is their objective the enemy bombers are alive with bustling activity as the bombing crews take station and prepare for the impending attack.

Although the machine gunners at their several posts keep vigilant watch for defensive interceptor fighters, no one is seriously alarmed at the possibilities of effective defense measures and even when the surrounding gloom is shattered with appalling suddenness by the piercing glare of a hundred searchlights, there is little concern on the part of pilots and gunners of the swiftly approaching planes.

Are they not flying at an altitude of at least 20,000 feet and at a speed in excess of 200 miles per hour? What pursuit plane could hope to attain height and find them in the short time that will elapse before they, their awful mission accomplished, are miles away on the return journey and within protective range of their own fighters!

Suddenly the searchlights, which hitherto have contented themselves with an aimless probing of the starry vault, swing with deadly unison and pick them up. Almost instantaneously the cold hand of an unreasoning fear clutches at the squadron leader's heart as in the tremendous glare he sees the ship next in line disintegrate before his eyes. While he is still frantically groping for an explanation—for there have been no signs of gun fire—the wreckage goes whistling to its doom and is followed by another and yet another of the ships which comprise his command!

Some burst into flames or explode, but for

ENEMY AIR RAIDERS

by DOUGLAS ROLFE

Automatic airplanes, steered and flown by special photo cell equipment invented by the Englishman, Mr. Sidney G. Brown, may revolutionize war air raids.

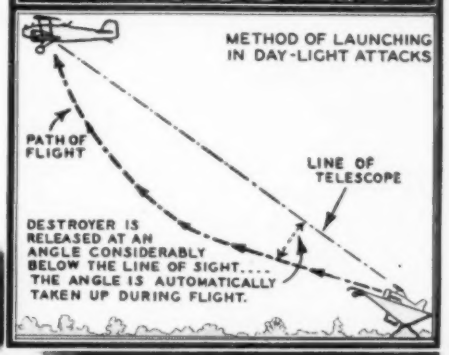
the greater part the stricken planes appear simply to crumple in the air. The illuminated night is full of falling planes and at this moment the bewildered commander's fear mounts to sheer terror when his ship staggers under a frightful impact from some unobserved object.

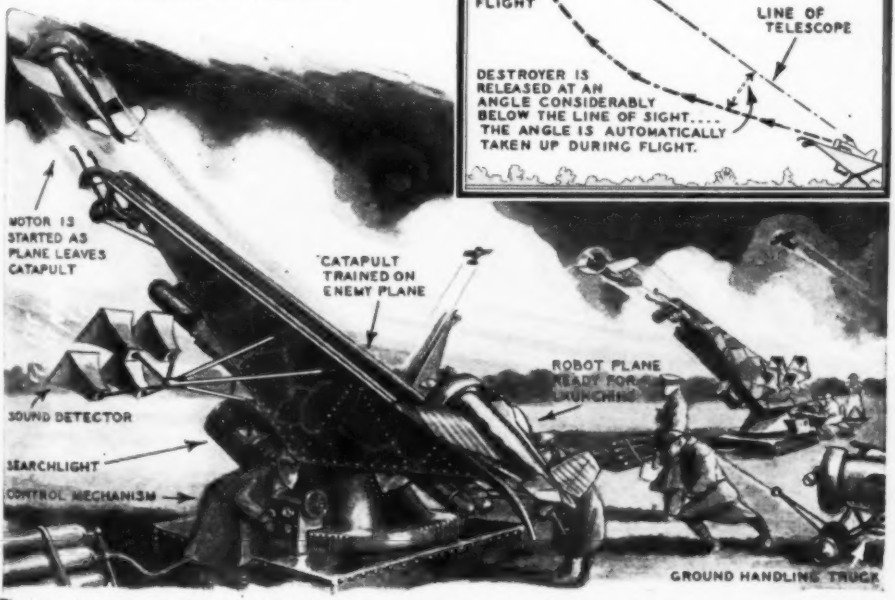
As the few lucky survivors hurriedly retreat from the scene of disaster there is muttered talk about collision in the air but all agree that, even allowing for the blinding glare of the searchlights impinging upon them, it is unthinkable that so many ships would have piled into each other. Yet here is practically an entire squadron destroyed within a few minutes of its objective!

This is the devasting picture painted for the outcome of bombing attacks in the future if Sidney G. Brown, world famous

(Continued on page 123)

ENEMY BOMBER
TELESCOPE DIRECTED TO REAR PICKS UP THE SEARCHLIGHT BEAM AND FOLLOWS IT TO THE TARGET.
ASSISTED BY SOUND-DETECTOR THE SEARCHLIGHT IS HELD ON TARGET
DESTROYER IS SHOT INTO THE LIGHT BEAM
TELESCOPE REVERSED
SEARCHLIGHT
METHOD OF LAUNCHING AGAINST NIGHT RAIDERS


METHOD OF LAUNCHING IN DAY-LIGHT ATTACKS
PATH OF FLIGHT
LINE OF TELESCOPE
DESTROYER IS RELEASED AT AN ANGLE CONSIDERABLY BELOW THE LINE OF SIGHT.... THE ANGLE IS AUTOMATICALLY TAKEN UP DURING FLIGHT.



The idea of the new English invention is to launch robot planes by catapults as shown. The robot planes will be highly powered, but lightly loaded as there will be no landing gears or crew. They follow a beam of light, and in reality are flown by searchlight beams. The present attack speed is tentatively set at 450 to 500 miles per hour.

Flying Postoffices Drop Mail Into Wire Nets on Ground

Artist's sketch of plane dropping mail tube into special net on ground. Congressman Brunner, left, holds one of the tubes.

THE postoffice department is conducting experiments at Brooklyn, New York, with new "flying postoffices"—large multi-motored air liners which have complete facilities for sorting mail en route, and for delivering it without making a landing.

Congressman W. F. Brunner, chairman of the Airmail committee of the U. S. House of Representatives, watched the tests.

The mail is placed in sturdy steel tubes used for pneumatic mail systems. Each container weighs 20 pounds, and can hold 14 pounds of mail. Mail is sorted into these tubes, and one or more of them dropped as the plane swoops low over the ground net.

On smaller planes the tubes may be carried under the fuselage in the same manner as aerial bombs. The tubes are rushed from the airport terminal by an underground pneumatic mail system.

Diagonal Bathtub Is Revolutionary

THE introduction of a new diagonal bathtub marks the first major change in bathtub design since the first installation in 1841.

Though the new tub is but four feet square, it has just as much room for bathing as the rectangular tubs. The bathing recess extends diagonally across the corners, with two seats in opposite corners. Mothers can sit comfortably while bathing children. The seat in the rear is very convenient to use while taking a shower. All plumbing is concealed under the rim.

Rear seat of new square bathtub is convenient to use for a shower. Mothers may use front seat while bathing children. Tub is 4 ft. square, and fits anywhere in bathroom.

Radio Calls Movie Star to Work

HERBERT MUNDIN, movie star, recently had to work in four different pictures at the same time. Finding it rather difficult to keep track of his working day schedule, and to know just where he was wanted next, he had to use a portable radio set.

With radio communication the directors had but to step up to the microphone to call their "much-in-demand" actor.

The tiny radio set and batteries are supported by a sling strap. Headphones are used for reception, with a tiny loop aerial attached to them. No ground wire is needed since transmitter is close.

"Calling Herbert Mundin to stage 6"—messages such as these are radioed to this actor as he works on movie lot.

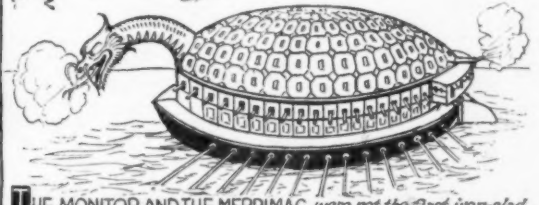
BONES *of Million* MEN *build* TEMPLE; *Nic Sprank in* ODDITIES *of* SCIENCE

BANANA OIL IS NOT MADE FROM BANANAS *nor any other fruit, it is one of the numberless products derived from coal tar.—*
Frank Turner, Elmira, NY.

FINGER NAILS 30 FEET LONG!- *Man grows four inches of finger nails a year, at that rate on reaching the age of ninety his finger nails will be 30 feet long if he does not cut them.*
—Roy E. Blood Jr., Portland, Me.

A SEA COW'S MILK IS MORE NUTRITIOUS THAN THAT OF DAIRY COWS.- *An African farmer, who has learned to get 75 quarts a day from a sea cow, claims the milk has a high fat content.- E. Doskocil, Joliet, Illinois.*

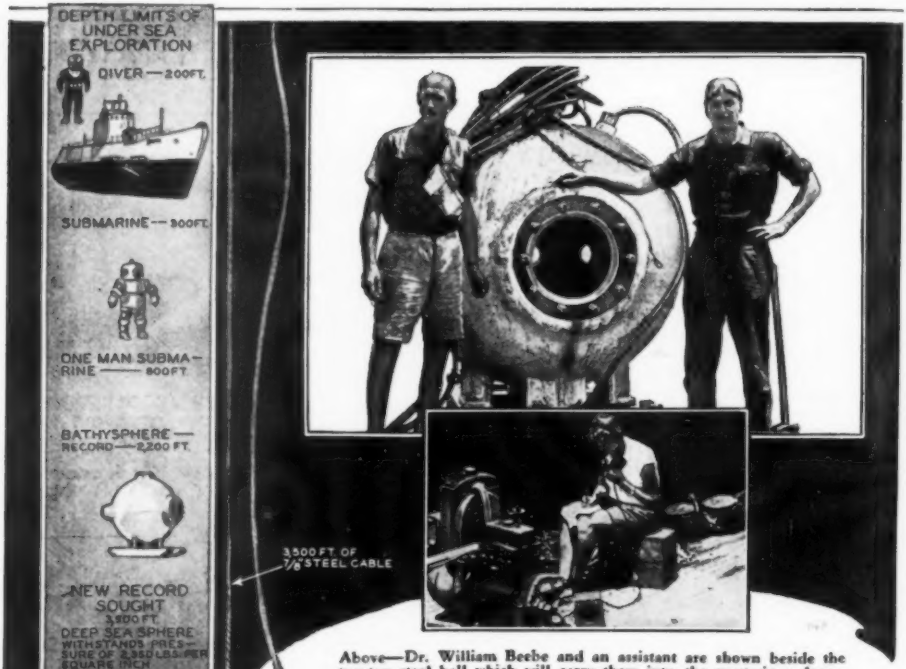
BONES OF A MILLION MEN *were ground up to construct the White Bones Towers of Liang Chow, China. These men, friend and foe alike, fell in the Mohammedan Rebellion.*
—John H. Moran, Sydney, Australia.



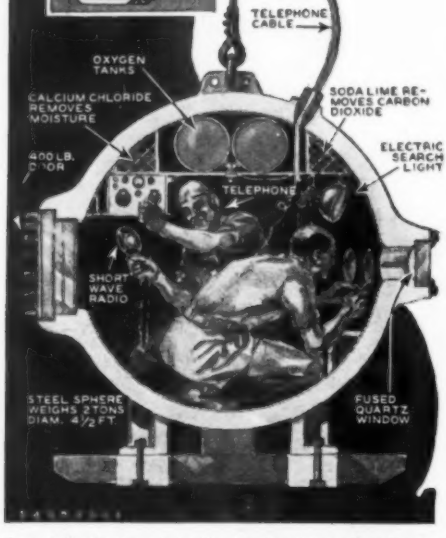
THE MONITOR AND THE MERRIMAC *were not the first iron-clad battleships:-The Korean iron-clad Tortoise Boat, invented by Yi Soon Sin, enabled Koreans in 1590 to defeat the Japanese general Hideyoshi at the battle of Chinhai Bay.-*
Irving Wallace, Kenosha, Wis.

Win $1! Send your Oddity of Science to Nic Sprank, Modern Mechanix and Inventions, 529 S. 7th St., Minneapolis.

Explores Davy Jones' Locker in Record Dive


DEPTH LIMITS OF UNDER SEA EXPLORATION
DIVER — 200FT.
SUBMARINE — 300FT.
ONE MAN SUBMARINE — 800FT.
BATHYSPHERE — RECORD — 2,200 FT.
NEW RECORD SOUGHT 3,000 FT.
DEEP SEA SPHERE WITHSTANDS PRESSURE OF 2,250 LBS. PER SQUARE INCH
3,500 FT. OF 7/8 STEEL CABLE

Above—Dr. William Beebe and an assistant are shown beside the two-ton steel ball which will carry them into the mysterious deeps. Phone communication is maintained between ship and sphere, below.



An artist's drawing of the "bathysphere" in s[illegible] showing the various points of mechanical and scientific [illegible]ration.

FIRST man ever to make a round trip to Davy Jones' locker in safety, Doctor William Beebe, noted deep-sea explorer, is planning a new series of dives this summer which will take him deeper than any human has ever gone before.

Establishing a base at Nonsuch, Bermuda, from which his 1930 and 1932 dives were made, the scientist is seeking a new depth record of more than 3000 feet which will enable him to open fresh chapters in deep-sea exploring.

Doctor Beebe, a sort of scientific Jules Verne, was born in Brooklyn fifty-seven years ago. Although chiefly known for his marine expeditions, he began his scientific career as honorary curator of the New York Zoological Society. He has roved the far frontiers—British Guiana, the Himalayas, Borneo—and explored the mysteries of the Sargasso Sea.

Six feet tall and tipping the scales with 135 pounds of wire-taut muscle, Beebe is said to hold other records in addition to his diving accomplishments. He can run a mile in five minutes, go to sleep in five seconds and make the world's shortest after dinner speech.

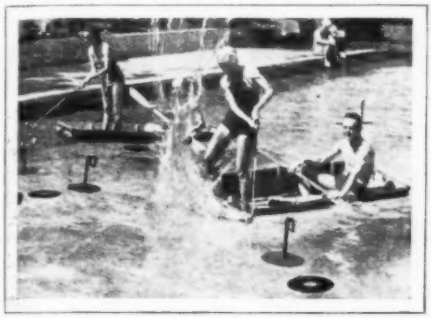
World's First Skyscraper Sign Has Fast Elevator Service

AN ELECTRIC advertising sign towering 290 feet above Chicago's lakefront is the world's first skyscraper sign. Its 1000 feet of neon tubing and 17000 electric lights flash an auto trademark over Michigan boulevard.

Also on the sign is one of the world's largest timepieces, a 50-foot high electric clock with a half-ton minute hand. There is elevator service to the control penthouse 150 feet above the ground and to the sign itself.

Chicago's skyscraper sign rises 290 feet above tracks of Michigan Central railroad. It faces south, overlooking Grant Park. Running messages appear on motograph beneath.

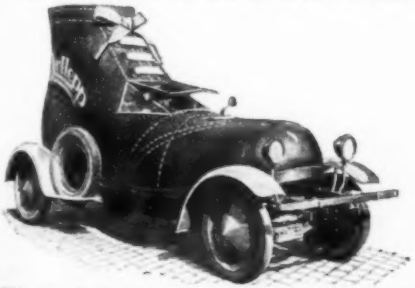
Water Golf Is Played From Rafts



Slices are splashes on this new swimming pool golf course.

THERE are no water hazards on a certain golf course in Pasadena, California—the entire course is laid out on the water. Caddies paddle the golfers about the course on tiny rafts. The holes are floating cups, anchored in position.

Giant Shoe Is Built Over Auto



This motorized shoe, built entirely of metal, brings publicity to a foreign shoe manufacturer. It is 16 feet long.

A FOREIGN shoe manufacturer, desiring to advertise his business, built a giant shoe 10 feet high and more than 16 feet long. The metal shoe is mounted on a lengthened automobile chassis, with a windshield above the instep. The canvas laces flap in the wind as the car races through the streets.

Guard Prevents Lipstick Smears

A TINY device which slips between the lips effectively prevents lipstick from making smears while actresses try on gowns. Studio wardrobe departments are finding the guard especially valuable in protecting expensive costumes.

The device is pressed out of heavy paper.

These lip protectors keep lipstick smears off costly gowns when actresses change costumes.

Driver Rides High in New Bus

THE driver of a new German stream-lined bus sits high above the motor, in a little compartment located between the two floors. Steering rods and controls are all lengthened. Long tiers of windows give passengers on both floors a clear view.

The unusually high windshield gives the driver a clear view of the street ahead.

"Zep Bus" has two stories, with driver's seat between.

Blizzard-Swept Mountains

by **EARLE W. GAGE**

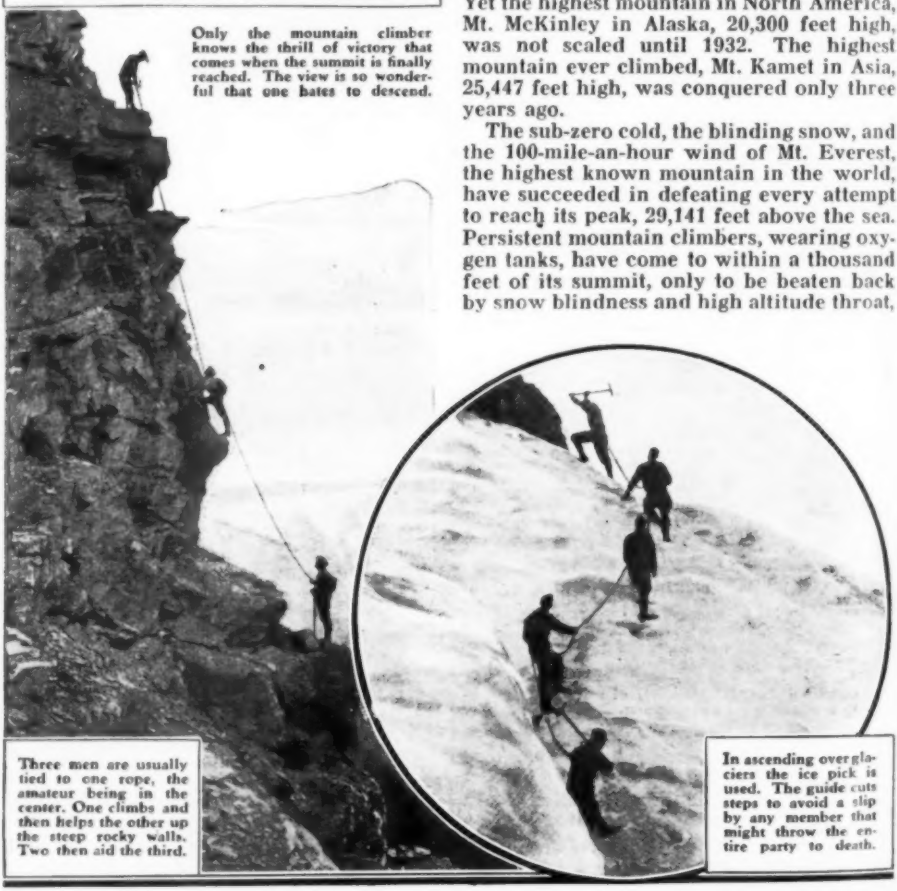
Only the mountain climber knows the thrill of victory that comes when the summit is finally reached. The view is so wonderful that one hates to descend.

DARING explorers have reached the North and South Poles. They have invaded every continent. One last frontier, "the roof of the world," defies the skill, ingenuity, and courage of man.

Intrepid adventurers have yet to scale hundreds of unconquered mountain peaks. Suffering, injury, even death, has been the lot of brave men who have attempted to meet the challenge of blizzard swept peaks in all parts of the world.

Systematic, scientific mountain climbing is not new. It began in 1854 with the ascent of the Wetterhorn, an Alpine peak 12,166 feet above sea level, by Sir Alfred Willis. Yet the highest mountain in North America, Mt. McKinley in Alaska, 20,300 feet high, was not scaled until 1932. The highest mountain ever climbed, Mt. Kamet in Asia, 25,447 feet high, was conquered only three years ago.

The sub-zero cold, the blinding snow, and the 100-mile-an-hour wind of Mt. Everest, the highest known mountain in the world, have succeeded in defeating every attempt to reach its peak, 29,141 feet above the sea. Persistent mountain climbers, wearing oxygen tanks, have come to within a thousand feet of its summit, only to be beaten back by snow blindness and high altitude throat,



Three men are usually tied to one rope, the amateur being in the center. One climbs and then helps the other up the steep rocky walls. Two then aid the third.

In ascending over glaciers the ice pick is used. The guide cuts steps to avoid a slip by any member that might throw the entire party to death.

Defy DARING EXPLORERS

"The roof of the world" is man's last frontier. It challenges most adventurous.

a dangerous parching due to the cold, dry air. On one of these expeditions, alone, thirteen men lost their lives.

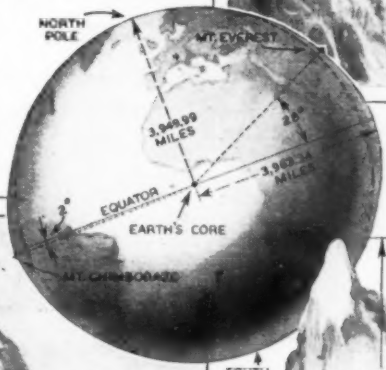
To the average man and woman, however, mountain climbing can be one of the most thrilling of summer sports. The main essentials are a fair amount of muscle and the ability to think clearly when danger lurks in precarious ledges of ice, jagged rocky walls, or the deep gorges below.

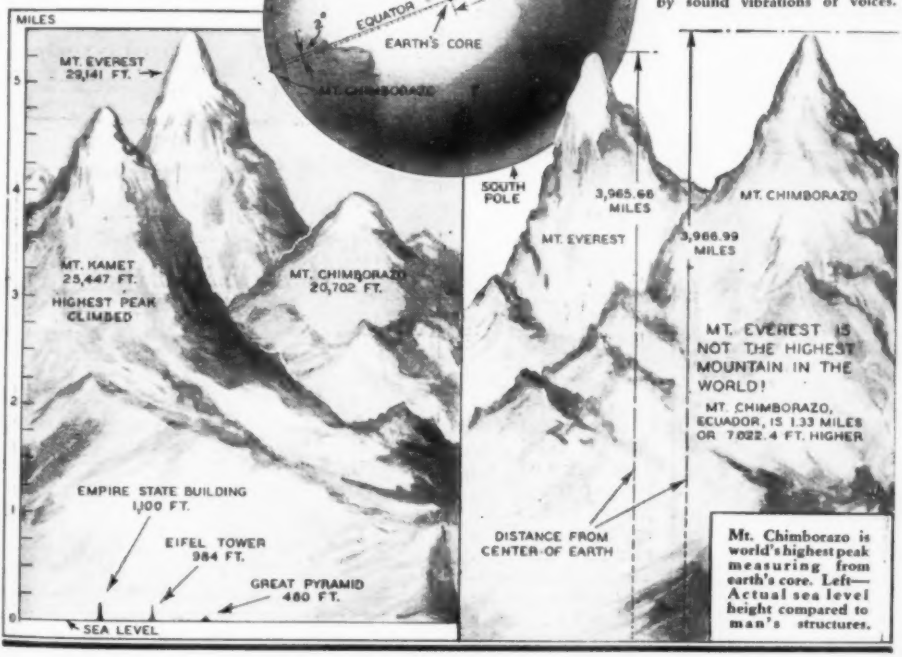
The first essential for a successful climbing party is a "leader," a man with Alpine experience who knows the way to overcome treacherous and slippery rocks at a

(Continued on page 121)

This party is nearing the snowy, wind swept summit of a mountain in the Canadian Rockies. Roaring avalanches can be started by sound vibrations of voices.

Mountains are measured from sea level. Figuring from the center of the earth there are five peaks higher than Mt. Everest. Earth bulges at equator, as shown at right, making radius to poles shorter. Result — lower mountains near equator are "taller" than higher sea-level mountains north or south of equator line.

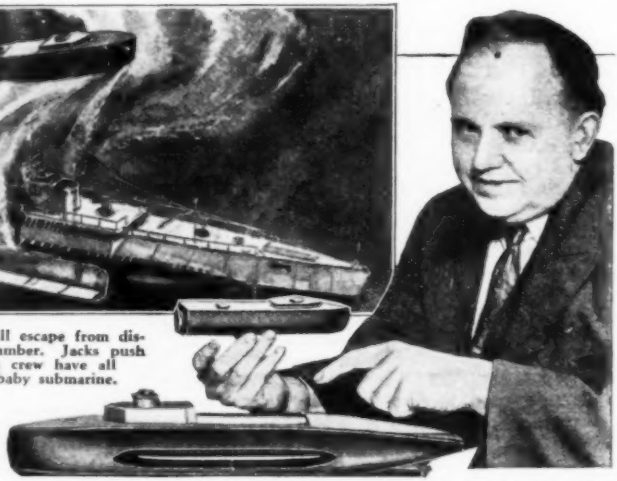



MILES
MT. EVEREST 29,141 FT.
MT. KAMET 25,447 FT. HIGHEST PEAK CLIMBED
MT. CHIMBORAZO 20,702 FT.
EMPIRE STATE BUILDING 1,100 FT.
EIFEL TOWER 984 FT.
GREAT PYRAMID 480 FT.
SEA LEVEL
3,965.66 MILES
MT. EVEREST
MT. CHIMBORAZO
3,966.99 MILES
MT. EVEREST IS NOT THE HIGHEST MOUNTAIN IN THE WORLD!
MT. CHIMBORAZO, ECUADOR, IS 1.33 MILES OR 7,022.4 FT. HIGHER
DISTANCE FROM CENTER OF EARTH

Mt. Chimborazo is world's highest peak measuring from earth's core. Left—Actual sea level height compared to man's structures.

Baby Submarine Attached to Ship Is Escape Chamber

Artist's sketch showing how crew will escape from disabled submarine in new rescue chamber. Jacks push chamber out of side of ship when crew have all passed into it. Chamber is really a baby submarine.



Walter Paddon, inventor, holds his detachable safety chamber, pointing out where it fits into side of mother ship.

A BABY submarine clinging to the deck of the mother ship, which can be detached in case of disaster to carry the entire crew to the surface, is the ingenious invention of Walter Paddon, of London, England.

When the submarine is sinking, the crew leaves the parent ship by an airlock. When all have passed into the rescue chamber, doors are bolted and the baby submarine freed by jack screws. It then rises to the surface by its own buoyancy, leaving the disabled parent submarine at the bottom.

Two foot long wood models have been constructed by Paddon to demonstrate the possibilities of his safety chamber.

No Frames on New Window Screen

AN AUTOMATIC window screen invented by a St. Paul man eliminates the unpleasant task of putting up the screens each spring. The roller screen is mounted in a metal box fastened to the bottom of the window frame. Raising the sash unrolls the screen, so that the opening is covered for any window position. The screen need not be removed in the fall.

New Light Bulbs Are 18 in. Long

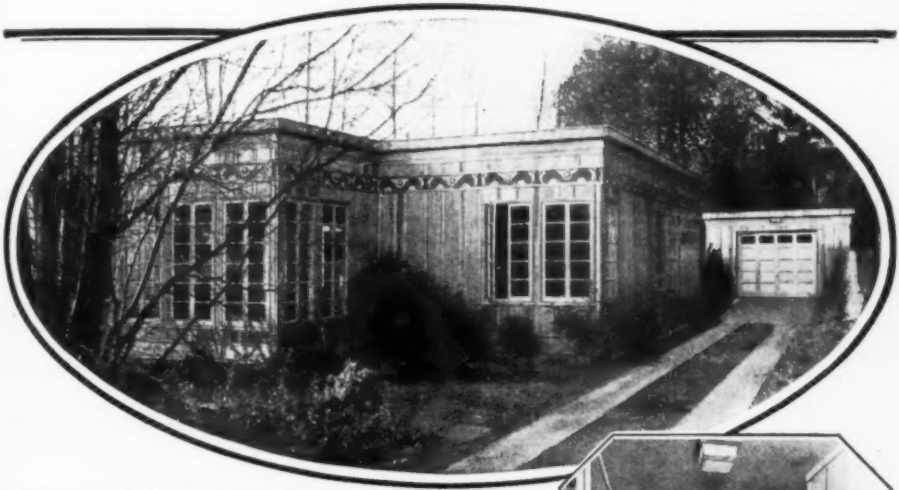
New bulb has single stretched-coil filament extending from one contact cap to other. It is made in 30 and 60 watt sizes.

SCREW bases are unnecessary on a new long filament electric light bulb. A special chrome iron contact cap is sealed directly into the glass tubing at each end, so that one contact is at each end of the 18 inch filament.

With this new construction lamps can be placed end to end to form a continuous line of light. The one inch diameter bulbs may be had with either plain or frosted glass.

No frames are needed when installing this screen. It rolls up over opening as window is raised, and is completely concealed in metal box on window sill when window is closed.

Panel Homes Can Be Built in Two Weeks



Adverse conditions delayed this "panel" home in Seattle, yet it was constructed in 21 days, ready for occupancy. Note general compactness and trim appearance of this unit, which includes garage shown at rear.

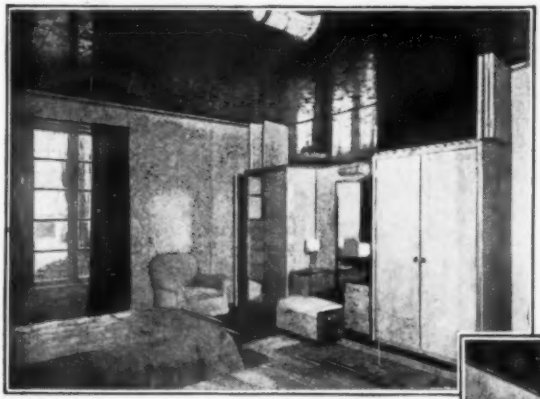
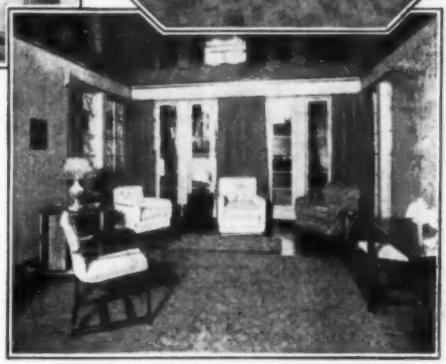


Photo shows attractive bedroom unit. All cabinets and other accessories are furnished with house and are designed for economy of space. The shutters above cabinet admit light.

SETTING new construction records, attractive modern homes will soon be available at most lumber yards in knock-down form which will permit assembly in two weeks, virtually without tools.

Wall panels and framing are all marked and cut to size. Interior and exterior finishing is done at factory, eliminating painting. Plumbing, light fixtures, kitchen apparatus and cabinets are furnished in proper sizes and quantities for the respective models.

The wall structures are insulated and the interior walls and ceilings, instead of being plastered, are paneled in natural plywood.



Above—Photo shows the well appointed kitchen. Note the arrangement of cupboards, sink space and other kitchen apparatus, which are furnished with the complete house unit. The comfortable living room is shown below. The walls are not plastered but are finished in plywood.

Gas Guns to Battle Wild Beasts on Galapagos Expedition

Dr. Wolfang von Hagen, director of the Galapagos expedition, is shown here with one of the powerful gas guns.

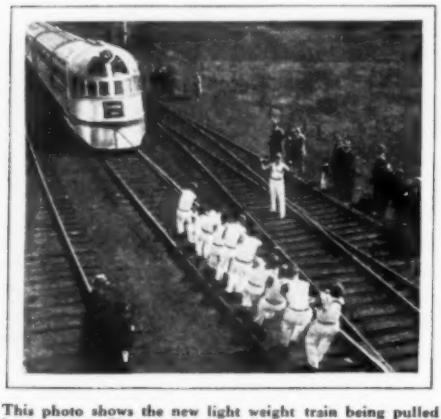
EQUIPPED with gas guns effective at 150 yards, a scientific expedition in search of new specimens will give battle to the animals abounding on the Galapagos Islands. Located about 500 miles west of Ecuador, these islands have been a magnet for scientists since Charles Darwin first obtained valuable data for his "Origin of Species" from study of its animal inhabitants. Since his visit, evidence has been accumulating tending to prove that the Galapagos archipelago was once connected with Central America. Similarity of fish, birds and land plants bear out this theory.

The new expedition numbering twenty-five members is embarking on a three-year cruise whose purpose is to erect a Darwin memorial and to carry on the great scientist's work.

Manpower Moves Three-car Train

LIGHT enough to be pulled by ten men, a new three-car train of stainless steel heralds a new era in railroad travel.

Driven by a 600 horsepower Diesel-electric plant, the 100-ton train attained a speed of 104 miles an hour in a recent trial run. The train has shock absorbing trucks and was built without a single rivet.



This photo shows the new light weight train being pulled by ten men. The total weight of the three cars is about 100 tons, only slightly more than the average Pullman car.

Court Ruling May Wreck Hotel

White lines on this picture show how floors above the eight-story level must be set back, according to law.

THE upholding of a Chicago zoning law by a U. S. court of appeals may wreck a Gold Coast hotel. After a six-year legal battle the courts have ordered the hotel's management to conform with Chicago building restrictions which require a "setback" of one foot for each nine feet above the eight-story level. Receivers of the property have pointed out that this ruling virtually orders the razing of the twelve upper floors, since funds for rebuilding are not available.

Coffee Automat Among New Home Aids

FOOD MILL quickly mashes vegetables and fruit. Simply place mill on slightly larger kettle or bowl, put in the food, and turn the crank. Curved beater attached to crank rapidly forces food through finely perforated bottom. Mill is excellent for making tomato juice, mashing potatoes or other vegetables.

URN for home use makes 3 to 25 cups of coffee automatically. Motor dips coffee basket into hot water for four minutes.

GRINDER will chop cupful of nut meats in a minute. Threaded cap of device screws on to any standard mayonnaise or preserve jar. Glass can be marked to show just when a cupful of nut meats have been ground. One side of metal hopper is easily removed for cleaning. Knives cut meats cleanly, without crushing or pulverizing any pieces.

CLEANING BRUSH which removes stains as well as brushes clothes is practical new device introduced in Berlin, Germany. Cleaning liquid is poured into reservoir in handle of brush, using tiny funnel to prevent spilling. Press reservoir slightly on top while brushing to release liquid and clean stains from suits or dresses. Photo shows method of pouring liquid into brush.

(Editor's Note: Addresses of manufacturers of the new household products on this page, or of any other products described in this issue may be had by sending a stamped addressed envelope to Modern Mechaniz and Inventions, 529 South 7th Street, Minneapolis, Minn.)

HOW PRESIDENT

Faced with problems that would have staggered a superman, President Roosevelt has come through his first year in better physical shape than when he took office. This story reveals the secret of his amazing vitality and what he does to maintain it.

A daily swim in the White House pool is an essential part of President Roosevelt's successful health program.

by **JAMES NEVIN MILLER**

EVERY day of his official life President Roosevelt is faced with momentous decisions affecting our national life; yet his greatest problem is not the settling of affairs of state but the safeguarding of his personal health.

The White House pressure is terrific. Once officially saddled with the destinies of more than a hundred million people, our chief executive faces a task which leads, almost inevitably, to shattered nerves, premature old age, physical breakdown and sometimes loss of life itself.

Proof of the tremendous pressure of the office may be had in the fact that only one of our former Presidents is alive today. Their average life span is less than 64 years. On the other hand seven wives of former Presidents are still living.

Keeping fit and trying to escape the crushing pressure of official affairs has long been the concern of our chief executives. Woodrow Wilson was a rabid baseball fan and found relaxation in reading detective stories. Harding tried to forget his executive worries in social gatherings with his friends and an occasional game of cards. Calvin Coolidge was an intermittent fisherman and sought physical stimulus in a mechanical hobby horse. Hoover stole away on fishing trips to his Rapidan camp whenever time permitted; and his "medicine ball cabinet" became a national byword.

An expert sailor, the President enjoys nothing more than a coastwise yachting trip with his boys. Here he is shown aboard the Amberjack, bound for a New England cruise.

Yet of them all, only Hoover survived the rigors of the President's office. That is what makes the career of President Roosevelt extraordinary.

Although handicapped, Franklin Delano Roosevelt is a veritable dynamo of human energy. His mind is lightning quick, his decisions sure, his speech forceful. He is a vibrant, electric personality living to a staccato tempo whose overtones abound in refreshing, gusty humor.

ROOSEVELT *Keeps Fit*

When official duties permit, the President boards an ocean-going yacht to enjoy a bit of deep-sea fishing.

Horseback riding plays a part in keeping the President fit. Photo shows him on one of his mounts, when he was governor of New York.

A baseball fan and former player, the President opens a world Series game by throwing out the first ball, as shown.

President Roosevelt has never missed a single night's sleep nor experienced anything approaching a nerve crisis. Today, after one of the most exacting years faced by any President since the World War, he is in better shape than when he took office, according to Dr. Ross T. McIntire, official White House physician.

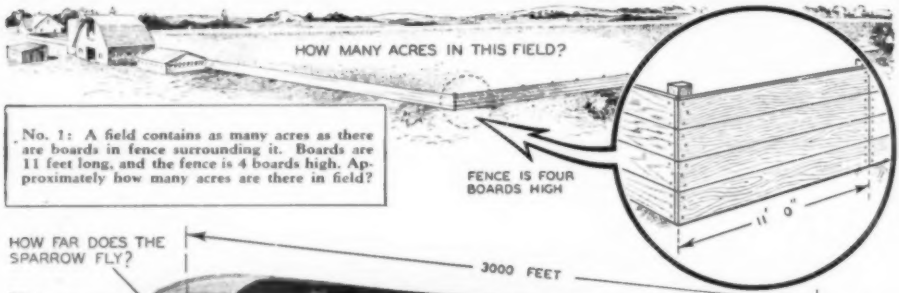
How does he do it? The President's formula for keeping fit is simple. Regular hours, regular exercise and temperance in all things are the basis for his code of physical and mental health. To keep his body fit the chief executive rides horseback, swims in the White House pool and takes long auto rides into the country. When time permits, he boards a sea-going yacht for a bit of deep-sea fishing and ocean air, hurries off to his experimental farm at Warm Springs, Georgia, or joins his boys on a carefree, coastwise sailing cruise.

When in Washington, the President's chief form of physical relaxation is swimming in the executive pool. Built by popular subscription, the beautifully tiled water playground is located in the west wing of the White House extension under a cover which makes it available at all times, regardless of weather conditions. Here, for half an hour every evening, the President wallows and frolics like a boy at play, while the cares of office literally drip off his broad back.

No chief of the White House—not even Teddy Roosevelt—has taken a keener inter-

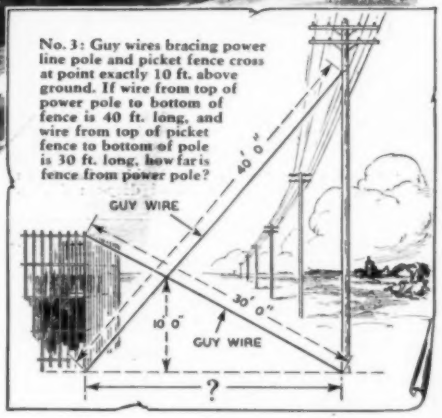
(Continued on page 119)

$25 PRIZES *For* 3 MATH PROBLEMS



No. 1: A field contains as many acres as there are boards in fence surrounding it. Boards are 11 feet long, and the fence is 4 boards high. Approximately how many acres are there in field?

No. 2: Sparrow perched on observation platform railing of train sees grasshopper on engine 3000 feet ahead. All car doors being open, bird flies through cars to capture tempting morsel, then returns to perch. Conductor notes train has moved 4000 feet in meantime. If train and bird speeds are constant, and no stop is made to eat grasshopper, how far did the sparrow fly with relation to the ground?



No. 3: Guy wires bracing power line pole and picket fence cross at point exactly 10 ft. above ground. If wire from top of power pole to bottom of fence is 40 ft. long, and wire from top of picket fence to bottom of pole is 30 ft. long, how far is fence from power pole?

MATHEMATICALLY inclined readers should have little trouble with these three interesting problems. Watch out for No. 1, though—you may have to use a few short lengths of fence boards.

Use just one sheet of paper for all your answers, writing on one side only. It is not necessary to send in your computations.

For the neatest and most accurate solutions accompanied by clear, concise explanations of the steps followed in each case, MODERN MECHANIX AND INVENTIONS offers $25 in prizes, as follows: First prize $10; second $5; and four third prizes of $2.50 each. Keep your explanations under 100 words for each problem.

Contestants must give age, occupation, and education, though this information will not be considered in awarding prizes.

Your entry should be postmarked before June 25, 1934. Decisions of judges will be final, and no entries will be returned. In case of ties, duplicate prizes will be awarded. Answers will be in Sept. issue.

Employees of this magazine or their relatives are not eligible to compete. You don't have to buy a copy or be a subscriber to enter. Address M-M Problems Contest, 529 So. 7th St., Minneapolis, Minn.

May Geometry Contest Winners

READERS of M-M still remember their Geometry theorems and postulates, judging from the flood of ingenious and artistic entries received in this contest. Many were very elaborate with parabolas constructed to locate the points.

James Goulding, of Pittsburgh, Pennsylvania, was awarded first prize of $10 by the judges for his really simple solution to this tricky little problem.

Second prize of $5 went to Edward Perkins, San Francisco, California. Four prizes of $2.50 each were awarded Gilbert Campbell, St. Paul, Minnesota; J. K. Roth, Hollywood, Florida; Louis Theo Larose, Shawinigan Falls, Quebec, Canada; and Harry B. Yaw, Battle Creek, Michigan.

Although there were ten different possible solutions submitted, some of these were very complicated. Prizes were awarded to those using the simplest possible construction and giving the clearest proof.

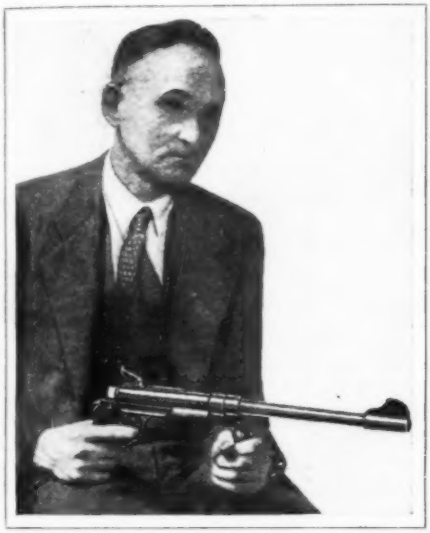
Paddling Raft, Copper Swim Suit Shown by Inventors

AN all-copper bathing suit, guaranteed not to shrink or be susceptible to moths, was one of the many unusual inventions on display at the Inventors' Congress in Seattle, Washington.

A paddle wheel life raft was designed by Eric von Hagen, Seattle inventor, to aid shipwrecked persons or aviators forced down at sea to reach land by simply turning cranks at each side of the raft. The paddles, operated by hand, propel the boat at a fair speed. The raft holds one person lying prone on the platform.

New life raft propelled through water by cranking paddle wheels. Right: Marjorie Downie tries on copper suit.

Machine Gun Fires Rocket Bullets



Machine gun no heavier than air rifle is demonstrated by inventor, Clyde Farrell of San Francisco. Rocket-like bullets leave gun with almost no recoil. Gun will not heat up.

A MACHINE gun hardly heavier than an air rifle, yet capable of firing 700 shots a minute with almost no recoil and no possibility of overheating, was recently announced by its inventor, Clyde Farrell of San Francisco.

Special bullets receive only an initial impetus from the firing pin, and generate their own energy in flight, just as do rockets. All remaining energy is released when contact is made with the target.

Bullets joined together with aluminum wire feed from an endless chain in the regulation machine gun manner.

The complete gun weighs only three and a half pounds. Models have already been tested, and are now at Washington to meet final patent requirements.

Navy Plane Model Is Complete

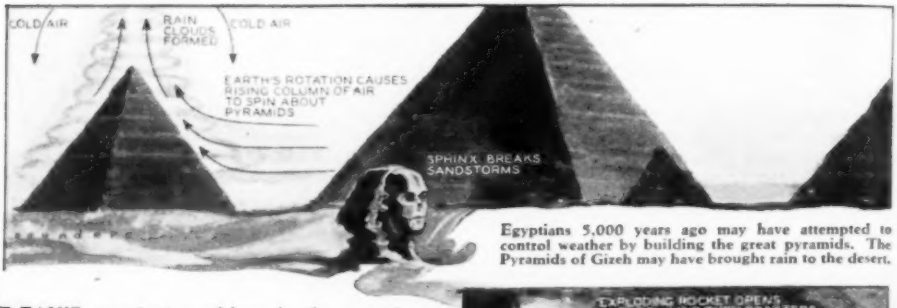
A MINIATURE Loening Amphibian Navy Observation plane, said to be the most complete working plane model ever built, has just been completed by 19-year-old Ben Hammer of Pasadena, California.

Powered with a ¾ horsepower engine, it is complete from controls and instrument board to machine guns and retractable landing gear.

Young Hammer has made a study of model aircraft building. He has repeatedly been employed by motion picture companies to construct realistic ship models.

Machine guns, retractable landing gear, and three-quarter horsepower motor make this model Navy plane most complete. Nineteen-year-old Ben Hammer, builder, makes similar models for miniature Hollywood movie sets.

Modern SCIENCE Predicts


COLD AIR
RAIN CLOUDS FORMED
COLD AIR
EARTH'S ROTATION CAUSES RISING COLUMN OF AIR TO SPIN ABOUT PYRAMIDS
SPHINX BREAKS SANDSTORMS

Egyptians 5,000 years ago may have attempted to control weather by building the great pyramids. The Pyramids of Gizeh may have brought rain to the desert.

MAN'S greatest problem is the weather. It destroys crops; it kills thousands of persons annually; it causes disastrous floods, tornadoes and cloudbursts; in the form of a drought it brings starvation, disease and suffering.

In three weeks of August, 1896, a "heat wave" caused 2,036 deaths from sunstroke in the United States alone. Two years earlier a hot spell destroyed 850,000,000 worth of crops in the single state of Iowa.

Hot weather, too, has been known to increase crime. Records of the New York City police department show that cases of assault and battery increase well over 70 per cent when the mercury hovered in the nineties.

No wonder then that man, probably since the dawn of civilization, has attempted to change weather to suit his needs. Recent theories bring out the possibility that the Pyramids of Egypt, built 5,000 years ago, may have been one of the earliest great efforts to control climate.

Dry ice scattered over clouds will cause condensation and start rain. The experiment was successful in Holland.

Rockets shot through clouds have shattered storms in Germany. The rocket allows the wind to break up clouds.

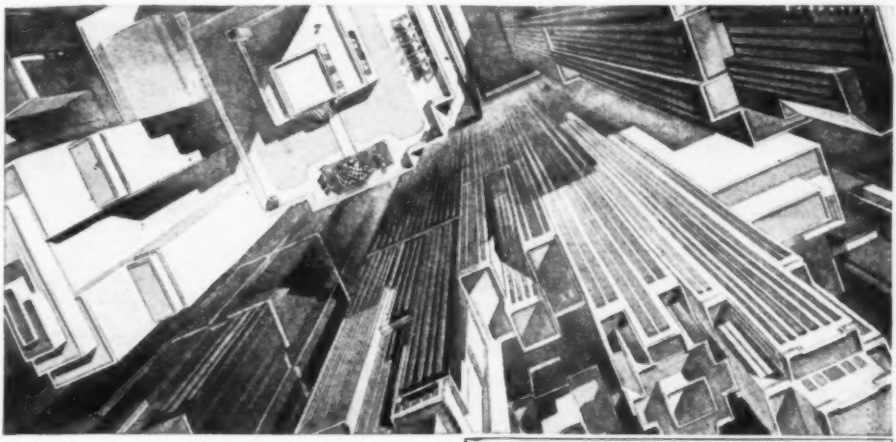
These massive structures, towering 500 feet in height on the borders of the desert, have always been mysteries to scientists. They are known to be the tombs of Pharaohs, but this question always arises: "Were they built for burial places only?"

To erect a Pyramid today would involve an expense of $156,000,000 and it would take 22,000 men about seven years to build it. It seems probable, then, that the Pyramids had another purpose—to bring rain and to break the force of hot winds laden with sand.

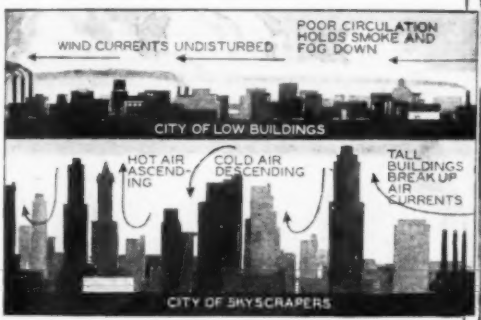
This warm, moist air, sweeping up from Central Africa or down from the Mediterranean, struck the sloping sides of the Pyramid. As it swept upward, the wind revolved about the triangular shaped structure. This spinning column of warm air continued to rise, it is believed, until it came in contact with cold air. Here condensation took place, clouds formed, and rain eventually fell.

It is said that this phenomenon still can be noted in Egypt. There is little doubt that the Pyramids break the force of sandstorms. The Sphinx, standing beside the

Made-to-Order WEATHER



The canyons of modern cities formed by tall skyscrapers are great ventilating shafts that have reduced deaths from heat waves. The drawings below illustrate wind action.


WIND CURRENTS UNDISTURBED
POOR CIRCULATION HOLDS SMOKE AND FOG DOWN
CITY OF LOW BUILDINGS
HOT AIR ASCEND-ING
COLD AIR DESCENDING
TALL BUILDINGS BREAK UP AIR CURRENTS
CITY OF SKYSCRAPERS

Great Pyramids of Gizeh, has almost been buried in sand deposited by winds.

For the same reason the modern city with its skyscrapers provides better air and temperature than a crowded city of low flat buildings. Weather bureau records show that heat prostrations in cities have been reduced considerably during the last generation. Warm air striking a skyscraper is forced to circulate upward around the building, forcing cold air down and reducing temperature in the streets.

Recent experiments have resulted in successful attempts to control rain, fog and frost. A huge electrodome tower, built by William Haight, of Whittier, Calif., breaks up ground fogs and frosts. It discharges negative electrical currents which force moisture in the air to condense and fall as

(Continued on page 142)

This 70 story building in Radio City, New York, without the conscious effort of the designers is improving weather conditions in the world's largest city through air control.

New Building Bricks Are Light Enough to Float on Water

Jeannie Manush and Rose Richie frolic about in pool with new floating bricks, which are even lighter than wood. Tiny air cells make new bricks very good heat insulators.

A NEW fire brick, one-third the weight of a standard brick of the same size, and light enough to float on water, is expected to revolutionize the brick industry. Robert F. Martin of Philadelphia is the inventor.

Smaller foundations will be possible in brick buildings, since the dead weight of the walls is cut in three. Handling costs will be much less.

Brick buildings should now be even less susceptible to changes in temperature. The many tiny air cells in the new material are almost perfect insulators of heat, making for lower home heating costs in winter.

Model Engine Runs Tiny Generator

A TWO-CYLINDER steam engine model that runs with almost exactly the same efficiency and speed as the original engine is arousing an unusual amount of interest at an exhibit of model projects in Beverly Hills, California. The model drives an electric generator which in turn lights a number of electric light bulbs.

Every part of the model engine was machined on a small engine lathe.

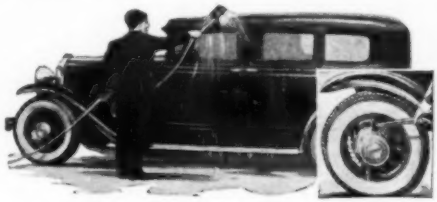
Frances Drake, movie star, examines model of steam engine and generator unit on exhibit in Beverly Hills, California.

Why Do People Enjoy Smoking?

RESEARCH workers at Yale University believe they have discovered why people derive pleasure from smoking.

"The gratification derived from smoking," they say, "has always been rather a mystery. Smoking, we find, produces a temporary increase in the concentration of blood sugar. The release of stored-up sugar is the source of a considerable part of the pleasant sensation of smoking."

Water Brush Washes Cars Speedily



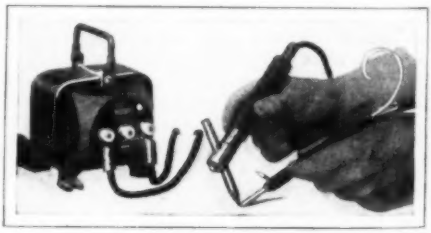
New wash brush attaches to hose, insures supply of clean water while washing car. Right: Brush fits between spokes.

A NEW auto brush which attaches to the garden hose simplifies the job of car washing. A constant supply of clean water is assured, a valve in the handle of the brush controlling the amount reaching the car.

Soldering Iron Uses Carbon Point

THE latest in electric soldering irons, a miniature arc welding set, is always ready to use. There are no copper tips to corrode and no waste of current when iron is not used.

A carbon holder and a solder-wire holder are connected across the terminals of a step-down transformer. When the carbon point and the solder are touched together enough current passes to melt the solder and heat the work.



Newest soldering iron is miniature arc welding set. Current passes between carbon electrode and wire solder, generating heat to melt solder and warm up work being soldered.

Japanese Planes Spread Tear Gas Barrage

Here is an artist's conception of one of the new planes in chemical action against a modern battleship. The aerial attacker has just dropped a load of chemicals which have combined with the water to form a choking cloud of tear gas.

RECENT tests of a new type of seaplane by Japanese officials added still another weapon to naval warfare. The new machine discharges a chemical which reacts, upon contact with water, to form a tear gas.

In addition to harassing the crews of surface vessels with the choking gas, the plane can also discharge chemicals which will create an unusually dense smoke screen. Hitherto used mainly as a defensive measure, the smoke screen now becomes an offensive weapon, forcing torpedo fleets to halt to avoid collisions and rendering them an easy prey to enemy attackers.

Rubber Mat Saves Bobbies' Feet

Photo shows an English bobby mounted on his comfort mat.

THE foot health of policemen on traffic duty in Plymouth, England, is being safeguarded through the use of small rubber pedestals.

These insulating mats keep the men's feet dry in wet weather, warm in cold weather and provide welcome relief from the heat of the pavements during the warm summer months.

Device Speeds Letter Sorting

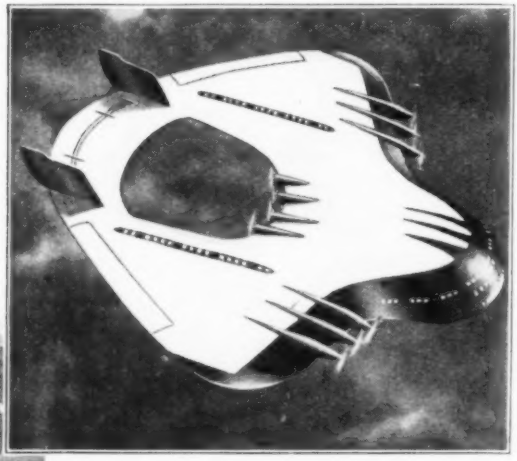
A postal employee receives instructions in the operation of the machine which sorts three thousand letters an hour.

AIDED by an amazing new machine, postal employees in Brighton, England, can now sort three thousand letters an hour, a record which triples the speed of the system formerly in use. By pressing the proper control levers on the machine's keyboard, the operator drops the letters from a moving belt into their respective boxes.

House Slippers Are Illuminated

BEDROOM slippers are now illuminated by tiny bulbs and dry batteries inserted in the hollow heels. The bulbs are set in the front of the heels to cast the beam ahead and on each side of the wearer.

Flying WING Is AIR LINER of Future



Left: Launching a model of the Antes single wing plane. Above: Proposed flying wing air liner, models of which have already been built. Note large opening in center of wing, with four pusher type engines mounted in fore part.

THE famous German sculptor Antes has developed a radically new type of airplane which promises to come closer to the ideal flying wing than any other type of aircraft.

The Antes plane has absolutely no fuselage or tail structure. The single wing structure is stream-lined in such a way that the craft is stable under all flying conditions.

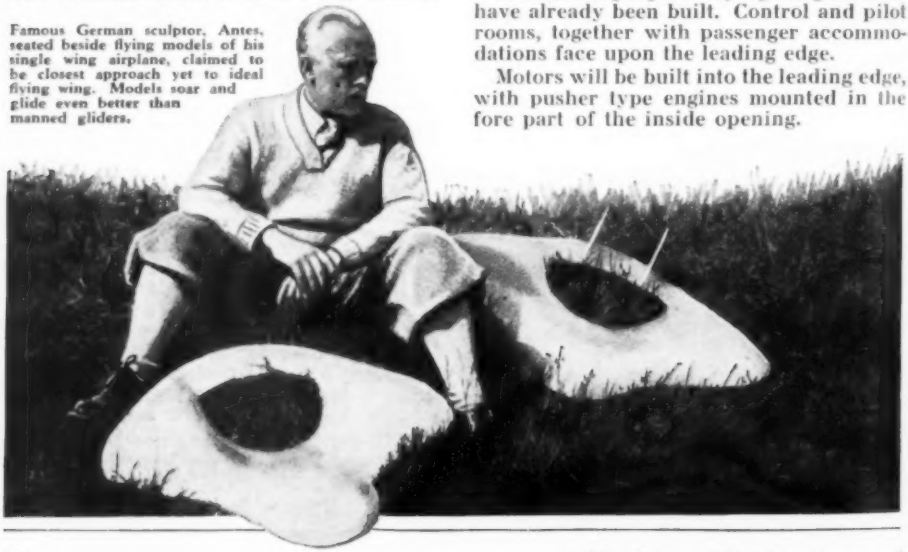
Perhaps the most unusual feature of this plane is the central wing opening. It is this opening which gives to the plane its unusual flying characteristics.

Flying models of the Antes Single-Wing have shown exceptional stability. Like a manned glider the pancake-like craft glides and soars over hill and dale, utilizing every upward air current.

Models of a proposed flying wing air liner have already been built. Control and pilot rooms, together with passenger accommodations face upon the leading edge.

Motors will be built into the leading edge, with pusher type engines mounted in the fore part of the inside opening.

Famous German sculptor, Antes, seated beside flying models of his single wing airplane, claimed to be closest approach yet to ideal flying wing. Models soar and glide even better than manned gliders.



Educated Clock Sings, Talks, and Plays the Pipe Organ

A CRIPPLED inventor of Akron, Ohio, has recently completed what he believes is the world's most wonderful clock. The remarkable instrument gives the comparative time in 27 different cities. In addition, it sings, talks and plays a reedless pipe organ every hour.

Every day the clock commemorates the death of America's martyrs. At the hour of Lincoln's funeral it recites the Gettysburg address. The time of President McKinley's burial is marked by a playing of the old hymn, "Lead, Kindly Light." At the hour of President Garfield's interment, the remarkable timepiece plays "Gates Ajar."

Valued at $50,000, the educated clock was built by 70-year-old Marvin Shearer after ten years of painstaking work. The clock contains 5000 pieces of wood, a mass of electrical control wires several miles in length, and is twice the height of an ordinary man.

This remarkable clock plays hymns, recites Lincoln's Gettysburg address and tells time of 27 different cities.

Speeding Auto Tows Aquaplane

Here is a land-powered aquaplane being towed along the water paralleling the highway between Miami and Key West.

DOWN in Florida, where good roads often parallel the water for miles at a stretch, aquaplane enthusiasts have invented a new sports thrill. Selecting a stretch of water whose banks are not lined with trees, the thrill-seekers hitch an aquaplane to a speeding automobile with a long tow rope. In the absence of motor boat wash, great speed may be attained by the rider.

Radio Hand Finds Hidden Weapon

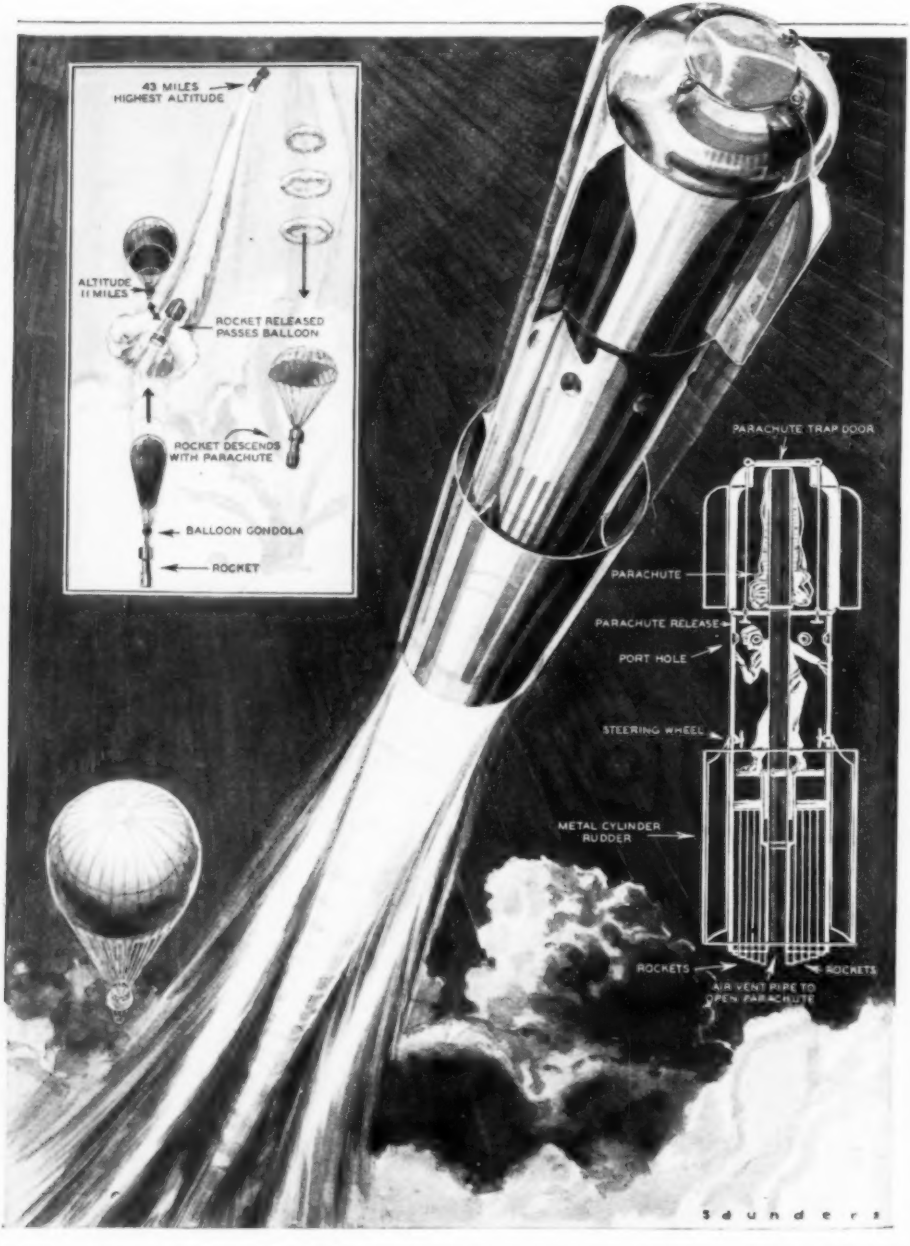
CHICAGO police have evolved an "electric hand" which locates concealed weapons carried by a prisoner. When passed over a suspect's body, the device quickly signals the presence of guns, knives, files or other metal objects.

Makes Celluloid Museum Models

BY COATING molds with liquefied, tinted celluloid, taxidermists of the Field museum are able faithfully to reproduce natural colors. Under the old system of painting, the coloring material filled the fine lines and gave the work an artificial look.

A museum worker is shown examining the cast of a snake which has been coated with tinted, liquefied celluloid, a new process which faithfully reproduces natural coloring.

Balloon-Rocket to Soar 43 Miles



A balloon-rocket conceived by a Wyoming inventor is expected to roar 43 miles into the stratosphere. Carried 11 miles by the balloon, the operator cuts loose, ignites two opposed rockets and soars 33 miles higher. One mile is lost cutting away from the balloon. When the rocket power is expended, an air vent is opened, filling a parachute which floats the tube to earth. Inserts show release of rocket and details of the operating mechanism of the cylinder.

Land, Water Plane Equipped With "Basketball" Wheels

A RADICALLY new type of landing gear is now being used on a German low-wing monoplane, permitting the ship to land with equal ease and safety on land or water.

Two large rubber balls, resembling nothing more than huge basketballs, spin freely inside cup-shaped boots. On land the balls turn just as wheels do on the ordinary land airplane. On water, however, the balls act as pontoons, skidding over the waves.

The unusual amphibian landing gear is the invention of Baron Boris von Loutzky of Germany. This gear has proved successful in both land and water tests on the Baron's own private plane. On land especially the air filled balls take up a surprisingly large part of the shock of landing.

Since the balls can be mounted on any land plane, they should find favor with light plane enthusiasts of this country.

Air-filled "basketball boots" on this German low-wing plane make it capable of safe landings on earth or water.

Novel Dowsing Rod Locates Water

Carl Hesse demonstrates his new dowsing rod. Nearness and depth of water are indicated on dial at right of device.

AN ARTIFICIAL dowsing rod developed by a German engineer, Carl Hesse of Chemnitz, Saxony, is claimed to locate water underground, and to indicate the depth at which the water will be found.

The device, which Hesse calls the "bathometer," is made up of two different twigs twisted around each other. A dial and pointer at one end indicate the proximity of water as the user carries the twig over regions where wells are needed. A bubbling source is found where rod turns down.

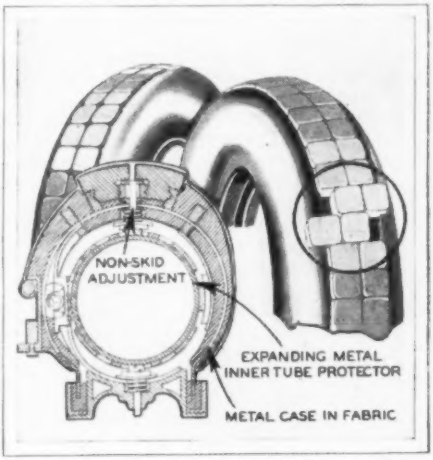
Northern Lights Hiss in Arctic

DURING a recent display of the aurora borealis scientists obtained confirmation of the stories told by Eskimos that these lights could be heard. C. M. Garber actually heard the hissing noise one morning while racing with dog teams near the Arctic circle to overtake a reindeer herd.

Non-skid Tire Is Puncture-proof

A TIRE which will not skid and will not collapse when punctured is the contribution of Albert E. Dietz of Washington, D. C., to modern motoring. He predicts that auto accidents on icy, slippery streets will be reduced to a minimum by this new tire.

The tread of this new tire can be adjusted by the driver while the car is in motion. By a lever arrangement the treads of the tire can be doubled in width to prevent a skid. Inside the tire is a core of light metal which sustains the weight of the car when the inner tube is punctured.



At touch of lever near driver's seat, treads of this newly-invented tire spread out to prevent skids. Metal case inside tire supports car when inner tube is punctured.

Homes Reflect Owners' Curious Whims

Not a sea-going yacht, but a California man's idea of a novel home. Note the dummy anchor at the "ship's" bow.

Virtually quake-proof is this unusual California dwelling, formed of a niche in two huge rocks. Entrance has been closed with a concrete lean-to. Photo shows the owner.

Although the miniature castle, left, contains 18 rooms, it occupies ground space of only 14 by 19 feet. Occupants must walk sidewise in the narrow halls. Photo above shows the novel home made from an old smokestack by a Portland millwright. City authorities recognize it as a bona fide dwelling and have given it a house number.

TAKING their cue from the celebrated old woman who lived in a shoe, modern home builders, moved by whims or necessity, have fashioned strange dwellings which outrival the most fantastic nursery rhyme.

Perched on the sands of a southern California beach, for instance, is an ocean-going yacht which has never put to sea. It was built as a home, not a ship; yet the nautical influence is complete from ladder entrance and porthole windows to a dummy anchor which has been dropped overboard into the sand. Bunks are substituted for bedrooms and the stern is arranged for garage space.

A niche between two large rocks in the hilly country near Riverside, California, has been utilized to form an unusual home. The V-shaped nook has been enlarged with building blocks and closed with a door, forming a triangular room for its lone occupant and his dog.

An old ship's funnel in the Oakland estuary in San Francisco bay serves as an ingenious dwelling. The stack lies on its side, the ends closed with a door and window opening, probably the last port of call for an old seaman.

The smallest 18-room house in the world actually occupied by adults is a miniature castle boasting numerous turrets and towers. Owned by a California Scot, the building occupies a space only 14 by 19 feet. The living room is 5 feet by 6, the bedrooms 5 by 6. The kitchen is 4 feet square, housing a sink, cupboard and stove and opens into a 3 by 6 dining room containing the customary furnishings. In addition to these rooms the house boasts a nursery, sun room, study, workshop and various guest rooms.

In Portland, Oregon, a millwright has solved his housing problems with a structure 40 feet long and 7½ feet in diameter. He lives in an old smokestack and finds that he has so much room that he has partitioned off the back half of his strange dwelling, utilizing only the front half for his bedroom and a combination living room and kitchen.

Light Beams Guide Blind Thru Building Without Escort

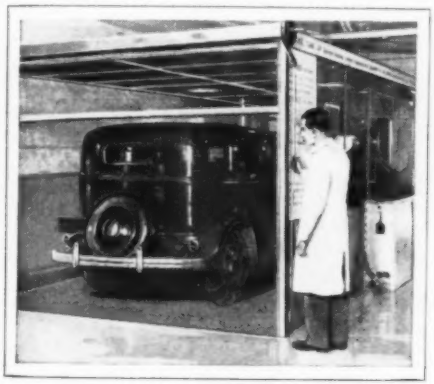
BEAMS of light now guide the sightless through building corridors and up and down stairways. The subject is equipped with a portable photronic cell unit which sounds a buzzer as long as the operator travels along the light beam. The buzzing ceases when the course is changed.

At points where two or more light beams intersect various combinations of sanded strips are glued to the floor to indicate locations of doors, stairways or corners.

Holding a buzzer unit in her hand, this blind operator has traversed the corridor guided by a light beam. Note reflection of beam at the extreme end of the hallway.

Car Radios Tested in Screen Cage

A NOVEL radio cage into which automobiles are driven is being used by a New York garage in testing and adjusting auto radios. Copper screen grounded at many points completely surrounds the enclosure, and is even imbedded in the concrete floor. The elaborate screening system eliminates all electrical disturbances outside the car.



Auto radios are easily adjusted in test cage used by New York garage. Copper screen surrounding cage on all sides entirely eliminates outside electrical disturbances.

Largest Dial Thermometer Built

This huge dial thermometer proves amazingly accurate.

THE world's largest dial thermometer has recently been installed at Atlantic City. The diameter of the dial is 22 feet; the pointer measures 9½'. The control element is a small helix of bronze tubing filled with a liquid which expands or contracts with each change in temperature.

Trout Enjoys Back Scratching

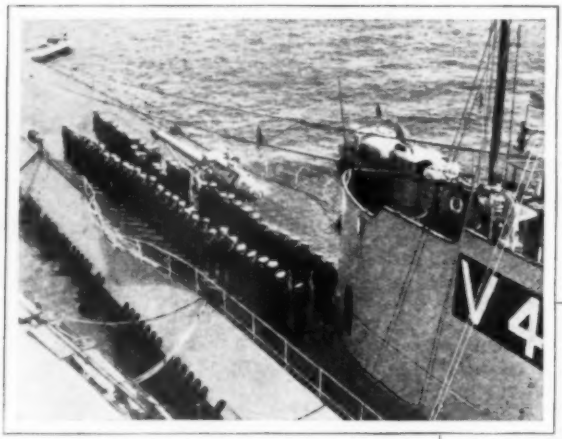
ARDENT anglers who have too often come out second best in their battles with the tricky denizens of the trout streams might take lessons in fish taming from Herbert Hyde of Salt Lake City, Utah. One of Mr. Hyde's most prized possessions is "Jumbo," a four pound rainbow trout that not only didn't get away, but doesn't want to.

In the sixteen years that he has lived in the Hyde tank, "Jumbo" has grown fat and lazy. He enjoys being fed by hand and after the meal is over insists on having his sides and stomach scratched to aid digestion.

An unusually large aquarium is required, with a continual supply of fresh cold water pouring in, to keep "Jumbo" in good health in his man-made home.

"Jumbo," a four-pound rainbow trout, has been the pet of a Salt Lake City household for 16 years. "Jumbo" takes food from his master's hand and seems to enjoy having his sides and stomach gently scratched.

Will New SUBMARINE



Officers and men line up for inspection on broad deck of U.S.S. V-4, one of the Navy's undersea giants. Note deck gun, one of the two six-inch pieces carried by V-4.

Modern American fleet submarines are vessels of 2000 tons or more. Ranging upwards of 300 feet in length, they are about eight times larger than World War craft. Carrying six-inch deck guns and a crew of 100 men, they are a force to be reckoned with in possible conflicts.

by

Lt. John Edwin Hogg, U.S.N.R.

NOTE: *The views and opinions in this article are those of the author and should not be construed as expressing the official views or opinions of the United States Navy Dept.*

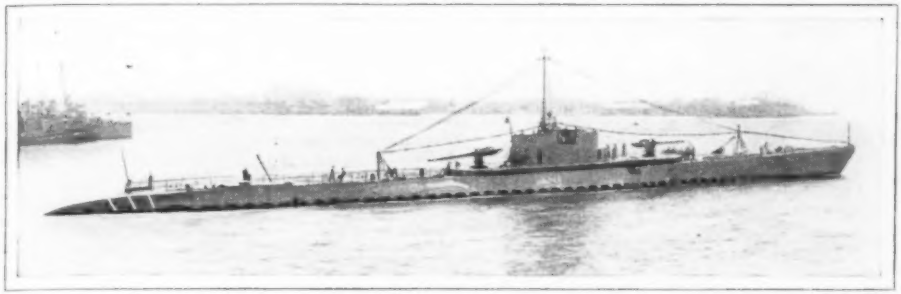
WHEREVER ships may travel in any future war there will lurk a powerful and invisible enemy—the modern submarine. It is a craft so vastly improved, so infinitely more deadly than its ancestors of the World War that apparently no maritime nation has yet realized the contributions to victory or defeat such vessels are destined to make in the next war.

To understand the modern submarine and its functions it is necessary to go back briefly into the history of the World War. Admiral Von Tirpitz, Chief of the German navy in 1914, had great faith in the submarine. He begged his government to have 1000 of them ready to go into action when the war began. Von Tirpitz, however, was over-ruled by the German military command. Had Von Tirpitz been heeded Germany today might have been master of the world. A thousand German submarines would have quickly beaten England to her knees, and the terms of surrender would have included the British navy. Germany would then have ruled the seas and her other European enemies would have gone down like a row of ten pins. The United States would have been next—a fat and easy prey for the powerful German military machine.

Here is the deck space shared by sixteen officers and men aboard an American submarine during the World War. Contrast this sea-going toy with the mighty V-4, left, above.

Submarines of the World War period had countless mechanical defects. If they descended to a depth of about 150 feet they leaked, and when they leaked, salt water in contact with the storage batteries flooded the ship with deadly chlorine gas. At a depth of 200 feet they could not empty their ballast tanks against the pressure of the sea and were unable to return to the surface. At a depth of about 250 feet these fragile contraptions crumpled up altogether. The air in them became foul when they sub-

Battleships RULE *the* SEAS?



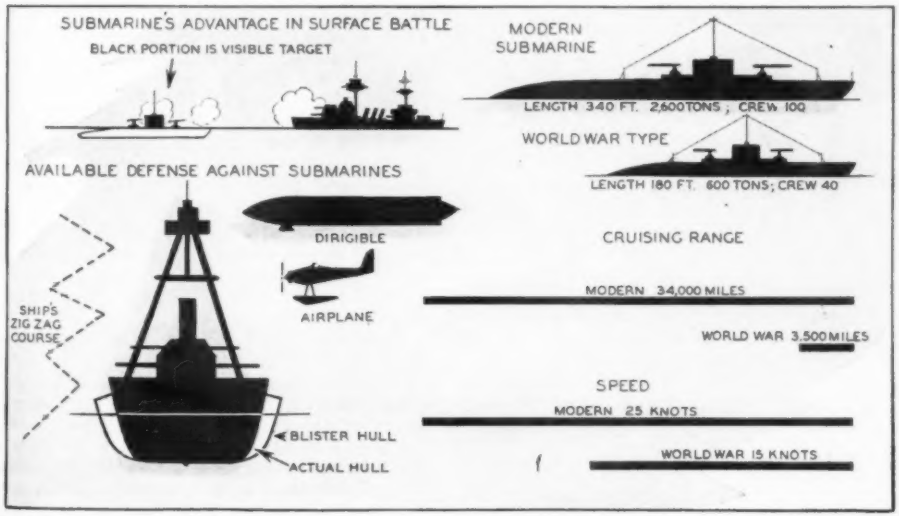
One of the most powerful fleet submarines ever built, the U.S.S. Nautilus is a 2000-ton craft, 273 feet long. She has a cruising radius of 34,000 miles and carries 100 men. Sunk to the "awash," target visibility is practically nil.

merged. There were torturing fluctuations of air pressure. The condensation of moisture gave them a peculiar clammy discomfort and subjected the crews to a perpetual dripping of water that frequently drove men insane. The food was poor and fresh water was doled out by ounces. Armed with guns, packed with mines, bombs, torpedoes, and other explosives, these weird vessels put to sea to harass and destroy the surface shipping of the enemy.

The whole amazing performance will be repeated in any future war between major maritime powers, but with this difference: modern submarines and methods of operation will make World War activities seem like child's play by comparison. With a displacement of only 250 tons, or thereabouts, the cruising radius of these World War ships was limited. They could remain under water only a few hours at a time. Their cruising depth was restricted and their fighting equipment was almost as unreliable as their manipulating mechanism.

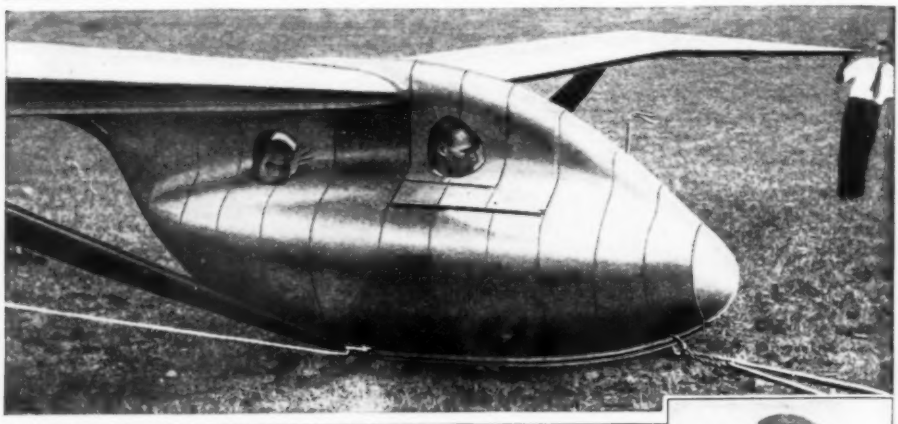
The modern American fleet submarine is a craft of 2000 tons or more, 270 to 300 feet in length. It is virtually eight times the size of its crude ancestors—twice the size of most destroyers—a sort of diving battle cruiser. It has a cruising radius of 34,000 miles independent of land and can remain submerged almost indefinitely. It carries a crew of 100 who live almost as well under

(Continued on page 126)



Partially submerged, the modern submarine can still operate its deck guns; yet with bow pointed toward the enemy is practically impossible to hit in a surface battle. As a defense against the undersea menace, battleships employ air scouts to locate the submersibles, steer a zigzag course to foil marksmen and are further protected by blister hulls which act as torpedo buffers. Note the vast improvement over World War types shown in the graphic chart above.

Richard Du Pont—Millionaire Glider Fan



ONE would expect to find a Du Pont in a Washington drawing room or on the sands at Newport; but young Richard Du Pont, son of the industrial magnate, reverses the procedure by spending a great part of his time in a workshop.

Out in the San Fernando valley, a short distance from Los Angeles, stands a small laboratory. There young Du Pont and his co-workers are daily experimenting to make the air currents safer for glider-conscious America.

Building gliders is not a fad with Du Pont—the adventurous hobby of a rich young man luckily possessed of both the time and money to indulge his fancies. There is work to be done in the glider field; and Du Pont intends to do it.

Hazards of Glider Flying

Flying a glider or a sailplane is at all times a hazardous business. In the past, too many amateur craft took the air without proper regard for safety in construction. Fatal crashes were not uncommon and the Department of Commerce stepped in to halt the mounting death toll.

A code governing construction and equipment of gliders was drawn and rigidly enforced. The fatalities stopped; but so did the business of sailplaning. The pilot ranks thinned. Today there is only about one licensed glider pilot where there were ten three years ago. The result is a total of slightly more than 200 licensed glider men in this country as contrasted with Germany's huge army of 350,000.

Viewing the situation, Du Pont decided that his wealth could serve no better purpose than to develop the science of gliding. One of his first steps was to enlist the aid of Hawley Bowlus who put gliding on the American front page in 1930 by remaining aloft near San Diego for nine hours and five minutes.

Above—Richard Du Pont is shown at the controls of his glider as he prepares to take his father, Felix Du Pont, aloft. The glider crashed shortly after the takeoff. Neither was injured nor was young Du Pont's enthusiasm for glider flying lessened. In 1933 Du Pont, shown at right, set an American gliding record of 122 miles, fourteen miles short of the previous international record.

Long hours are spent by Du Pont and Bowlus working over glider plans. As soon as they finish a sailplane, they test it thoroughly, determine how it might be made better, and proceed to build another one.

Through their efforts a glider plane possessing every safety factor will eventually be available to air-minded men who cannot afford costly experimentation.

The benefits of Du Pont's experiments are two-fold. Every glider pilot is a potential national defender. Any man who can fly a sailplane can, with little instruction, fly a motored ship, although the opposite is not necessarily true. Aside from its military aspects, glider flying is a valuable addition to American sports. Glider construction is not essentially expensive. The plane takes no fuel, requires no overhauling of the motor, needs no costly airport as an operating base. But gliding does require initial safety in construction. And that is what young Du Pont hopes to provide.

Swallows New Camera to Get 16 Pictures of Stomach

A CAMERA so small that it can be swallowed without discomfort takes sixteen pictures of the inside of the stomach.

A two inch long metal cylinder contains the camera, a roll of film, and a tiny flash bulb capable of 20,000 candle-power illumination. The control plunger runs through a two-foot rubber tube attached to the cylinder.

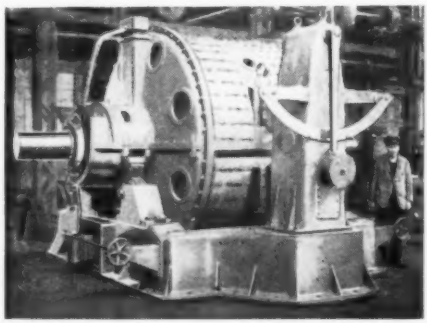
This unusual medical camera was developed at the Henckenbach clinic of the University of Vienna by Dr. O. Porges and other physicians. It is expected that pictures taken with it will show the first stages of gastritis, cancer, and other disorders which often cannot be seen on X-ray plates until too late.

An air pump forces the walls of the stomach away from the sixteen tiny lenses when a picture is snapped.

Each of the sixteen "shots" are developed into circular pictures two inches in diameter which taken together give a complete representation of the inside of a patient's stomach.

Above: Doctors try out new stomach camera on patient. Below: Florence Holstein holds camera in left hand, plunger in right. Wires lead to battery for photo flash bulb.

Giant Water Brake Absorbs Power



Gigantic "water-whirl" brake acts as variable load for huge motors, and records horsepower output on scale at right. Frictional heat developed is absorbed by water.

HUGE electric motors, Diesel engines and internal combustions can be loaded up to full capacity on the test floor by means of a new "water-whirl" brake developed by German engineers.

The braking process takes place in a giant water-tight cylinder, the frictional heat being used to heat water. A water ring formed on the inside is dragged along by hundreds of pins on the rotor and broken up by pins on the stationary cylinder. The amount of braking is controlled by the settings of the pins and by the amount of water permitted to enter the cylinders.

Brake horsepower is measured by scales in the usual manner. Inaccuracies of measurement are practically impossible.

New Machine Pans Out Placer Gold

A PORTABLE gold-mining machine which will handle two cubic yards of material an hour, recovering 90% of the flour and flake gold, is being adopted in many gold fields by placer miners.

Gravel and water are fed into the machine. The gravel is first washed free of clay, then passed over a revolving screen. The fine sands and gold pass through the screen into the riffle pan. Here a crosswise motion of 200 strokes per minute combined with motion of water rapidly removes gravel from the gold.

One cylinder gas engine at right drives this modern placer mining machine. Riffle pan beneath cylinder makes 200 strokes per minute. Water storage tank is at bottom.

New Shotgun Breaks At Side to Discharge Empty Shells

Here is the first .410 gun in the United States using the barrel over barrel arrangement. Circle at right shows the ingenious side break feature of the new gun.

HAILED as a boon to sportsmen all over the world is a new side break shotgun invented by Erich Klebe, German war veteran of Minneapolis.

The gun breaks sideways instead of downwards when discharging shells. The inventor claims the new feature greatly simplifies reloading when using a gun in a boat or in heavy underbrush. When a hunter is in a crouching position, he must get up to avoid fouling the barrel with dirt when reloading an ordinary gun. Klebe's gun eliminates this.

Another unusual feature of Klebe's gun is the mounting of the barrels on top of each other rather than side by side. This arrangement is not entirely new, but the inventor claims it improves accuracy and simplifies handling of the gun.

Klebe, who is shown in the photograph at left, is an expert gunsmith who operates a small gun and tackle repair shop. He learned his trade in Germany where he designed machine guns at the Krupp works during the war.

He designs and builds his own guns on the few tools of his shop. He has 21 claims on his new sidebreak gun. The sidebreak works on a pin that hinges the stock and barrels together.

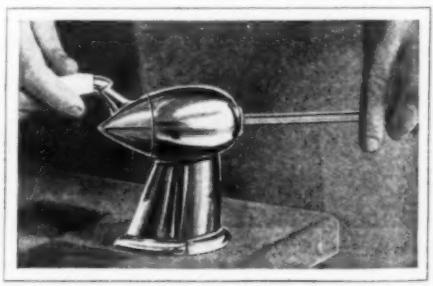
"Fireproof" Gasoline Invented

"FIREPROOF" gasoline, made possible through a newly invented device, will greatly reduce airplane and automobile tragedies caused by fire.

The new fuel has been made commercially possible by Frank A. Kane, of Astoria, L. I., N. Y. His device has been successfully tried out on a Sikorsky airplane motor. It operates on the principle of converting liquid fuels into hydrogenated or "dry" gas. As a result the converted fuel will not explode.

Roger Wolfe Kahn, orchestra leader (right) looks over fuel-converting device installed on Sikorsky plane. New non-inflammable fuels can now be used on any airplane.

Pencil Sharpener Is Stream-Lined



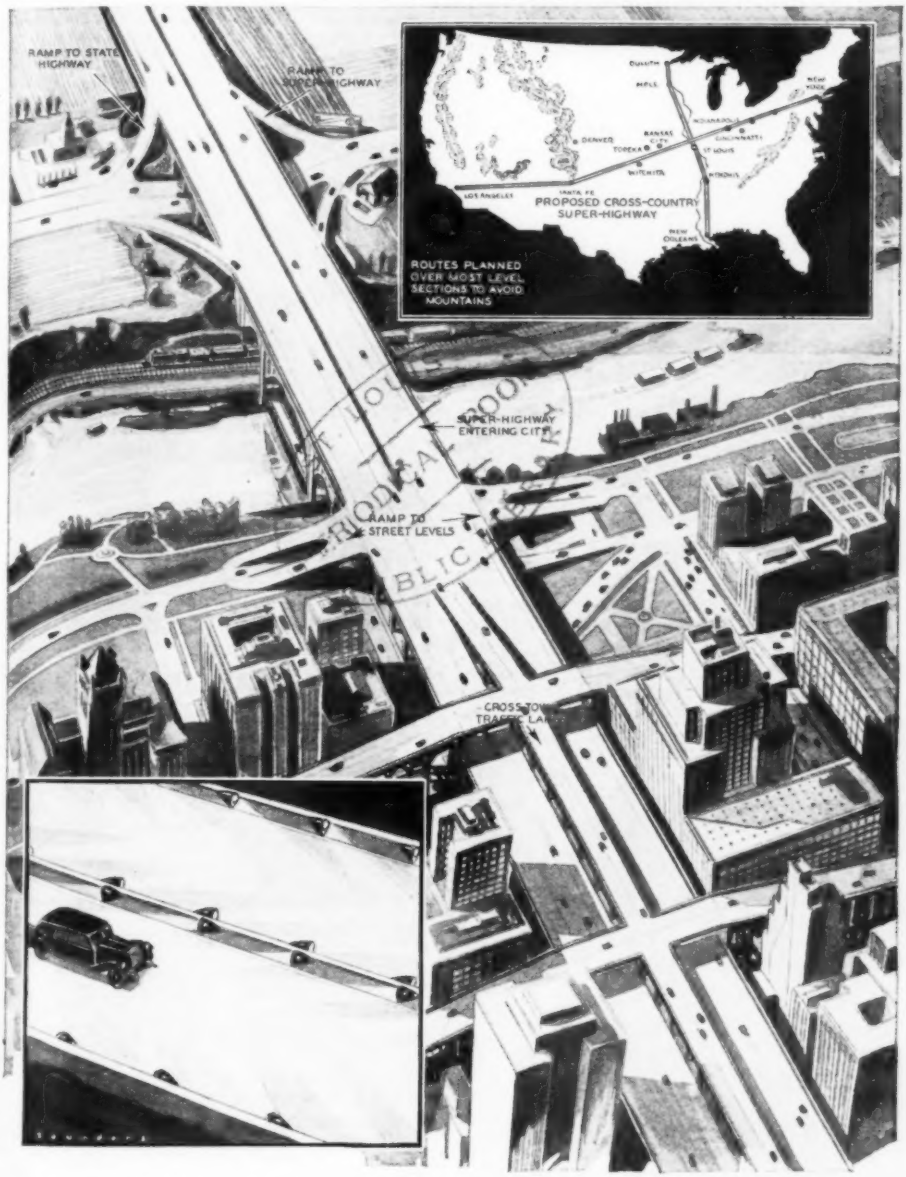
Stream-lined pencil sharpener, finished in gleaming chromium, was one of exhibits at Industrial Arts exposition in Rockefeller Center, New York City. R. Loewy is designer.

THIS stream-lined pencil sharpener is a novel addition to any office, home, or workroom. It was designed by Raymond Loewy, well-known designer of automobiles and office equipment.

Even though the sharpener is much smaller than conventional units, the inventor asserts it is just as efficient and even easier to use. The stream-lined chromium-plated finish with tear-drop design head adds a dash of modernism to the tiny device.

This new sharpener can be fastened to any table top or to the wall. Shavings are readily removed from the base.

Cross U. S. In 48 Hours On Proposed Road



An artist's drawing of the proposed coast-to-coast super highway on which automobiles may travel at speeds of 100 miles an hour, making the trip between New York and California in forty-eight hours. Road builders are now working on plans for a four-lane highway with all grade crossings eliminated. The super roadway will be elevated through towns with ramps furnishing access to the main road through a central lane. Night travel is expected to be fully as safe at high speeds as day touring. Parapet walls two feet in height and made of opal glass bricks are intended to flank the black-surfaced roadway. Imbedded in the walls and spaced about twenty feet apart, as shown in insert, the engineers intend to put lights whose hoods will direct the light on the pavement below the eye level of the automobile driver.

3000-Foot Soviet Palace to Have World's Highest Statue

Gigantic "Palace of the Soviets" will tower 3000 feet into the sky. A statue of Nikolai Lenin will be at the top.

PLANS for the "Palace of the Soviets," a 3000-foot high monument to Nikolai Lenin, father of the soviet government, have just been accepted by the central executive committee of the U.S.S.R. The design was drawn by a group of architects in competition with other such groups.

The exact purpose to which the structure will be put has not yet been announced.

A statue of Lenin, in heroic proportions, will reach into the atmosphere from the pinnacle of the giant building.

A powerful beacon light at the top will guide aviators.

Punctured Auto Tube Seals Itself

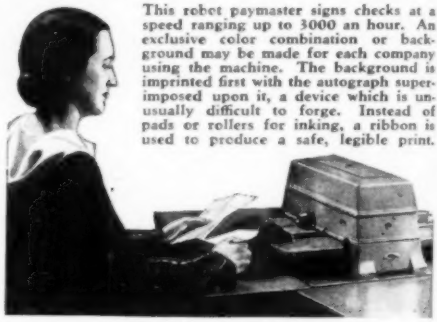
A NEW tire tube contains specially compounded plastic rubber which flows into a puncture, quickly closing it and preventing loss of air.

Unlike previous devices of this nature, the new tube gives unusual comfort in use and is light in weight. It can be used on the smallest car without jolting the passengers.

In a recent test an awl was driven repeatedly into one of the tubes; but the plastic rubber effectually sealed each of the holes with virtually no loss of air.

Honeycombed with nail punctures, this new auto tube sealed the holes with plastic rubber as shown in insert.

Check-Signing Robot Is Speedy



This robot paymaster signs checks at a speed ranging up to 3000 an hour. An exclusive color combination or background may be made for each company using the machine. The background is imprinted first with the autograph superimposed upon it, a device which is unusually difficult to forge. Instead of pads or rollers for inking, a ribbon is used to produce a safe, legible print.

FARM relief is being speeded up by the Department of Agriculture with the installation of a robot paymaster which issues signed checks at a rate varying from 2500 to 3000 an hour. The machine operates by means of a high speed belt and automatic trip, electrically controlled. The robot prints the autograph over a background design difficult to forge.

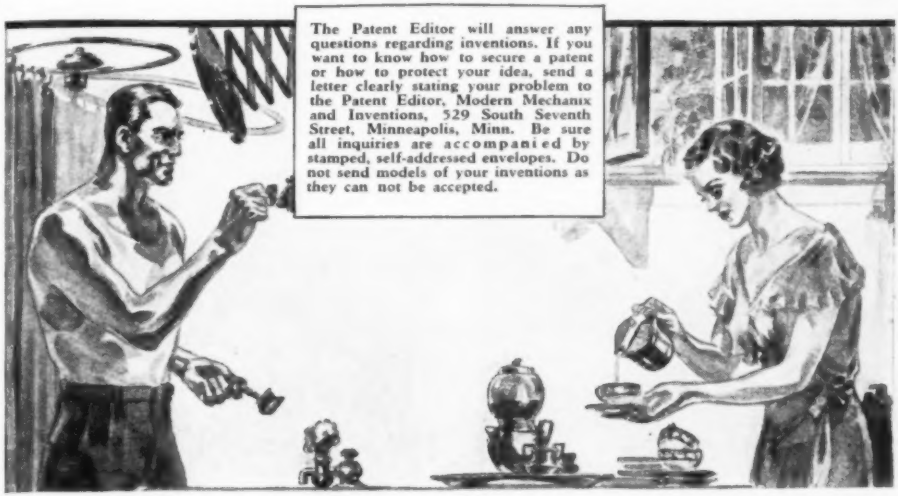
British Invent Midget Camera

ANSWERING the demands of photographic fans for even more compact equipment, a London manufacturer has perfected a tiny camera which takes pictures the size of a postage stamp.

The midget device takes eight photographs on a roll of film and is to sell for about a dollar.

Photo graphically shows size of the novel midget camera.

GREAT FORTUNES *Await Inventors*
Improved Razor Blade Sharpener Needed



The Patent Editor will answer any questions regarding inventions. If you want to know how to secure a patent or how to protect your idea, send a letter clearly stating your problem to the Patent Editor, Modern Mechanix and Inventions, 529 South Seventh Street, Minneapolis, Minn. Be sure all inquiries are accompanied by stamped, self-addressed envelopes. Do not send models of your inventions as they can not be accepted.

IT IS unfortunate that the need for speed in matters pertaining to inventions is not more thoroughly understood by the general run of inventors. The writer brings this point up in view of the fact that he has had a number of letters lately from men who have had the unfortunate experience of seeing somebody else making money with their ideas.

The man who succeeds in invention is the man who pushes his venture to the logical conclusion with all possible haste.

Among our problems this month we find a need which, while more or less obvious, has escaped the attention of inventors for many years. A small and portable miter box or device is needed that a carpenter can fold up and place in his tool kit. It should be made of pressed metal and sell for about one dollar.

Pitcher Device for Canned Milk

Housewives who use a number of cans of condensed milk during the week would greet with enthusiasm a combination opener, handle and holder for such cans which would transform them into pitchers. The handle should clip securely onto the can and should also carry a special opening device which will pierce two holes in its top.

A ten cent device that could be pushed down a kitchen drain pipe to relieve congestion and save plumbing bills would be a big seller.

A small motor-driven gadget that could be used for cleaning and scouring pots and pans would be a popular item in any household if the cost were low enough.

Every large factory is supplied with compressed air which is carried throughout the various buildings by means of high-pressure pipe lines. What is needed is a bench vise that will get its grip from compressed air, allowing the operator simply to press a button to close the vise. In the hand finishing of castings, this would be a valuable contribution.

Remote Control Window Ventilators

Those who sleep in well-aired bedrooms would be interested in a window ventilator that could be closed in the morning without the necessity of getting out of bed. The device should take the form of an electrically controlled ventilator, operated by means of an electro-magnet or solenoid which could be actuated by a button at the bedside. Such an article could be sold for $5.00, leaving a nice royalty for the inventor.

There is still need for improvement in the matter of razor blade sharpeners. A fortune awaits the inventor who can evolve a compact bathroom model into which blades may be inserted and quickly sharpened without manual effort. If the device could be made to sell for ten cents, the sales would mount into staggering figures.

The American public spends millions of dollars on playing cards each year. These

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Sound Waves Bounce Back to Megaphone, Warn Pilots

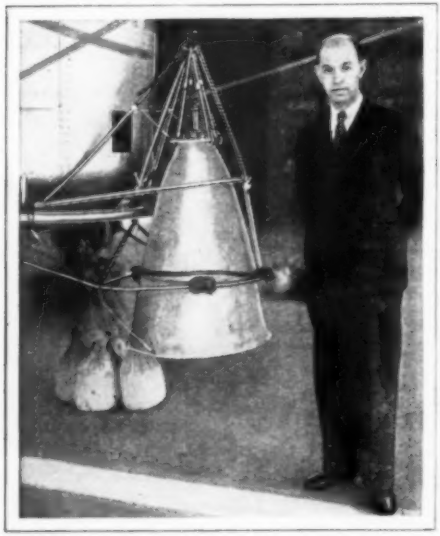


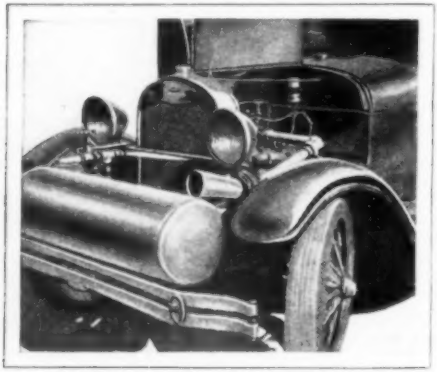
Photo shows closeup of the receiving horn with its inventor, Leo P. Delasso. A sound wave, broadcast from the plane, bounces back to the horn to register height.

THE dangers of flying an airplane in foggy weather are expected to be averted with a new device which warns pilots of their closeness to the ground. A sound wave is broadcast from the plane to the ground and the echo is picked up on the rebound by a receiving horn similar to a megaphone.

A specially tuned siren horn, calculated to blast through wing and motor noises, creates the sound. An instrument shows the number of feet from the ground by translating into feet the number of seconds required for the sound to travel to the ground and back.

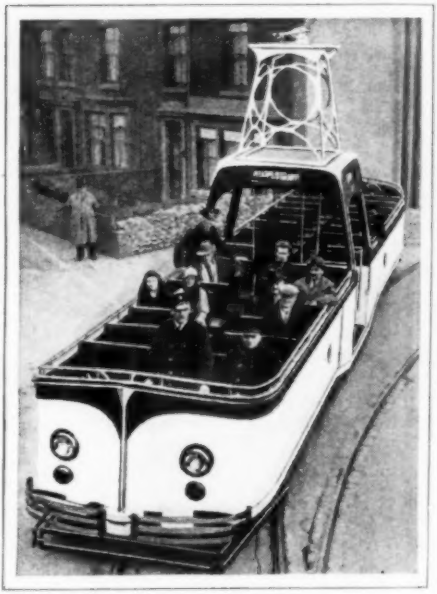
Use Ford Engine as Air Compressor

OLD Ford A or B auto engines are easily changed over into air compressors which have sufficient capacity to operate rock-drilling jackhammers, concrete tampers, or spray painting outfits. A special head, with air valves on two of the cylinders, is used. Two cylinders run the engine, and two compress the air. A pressure tank may be mounted on the front bumper, or the complete unit installed on a trailer or stand. The unit may also be used by filling stations for pumping up auto tires.



Two cylinders of a Ford A or B engine are used as air compressors by installing special head and air valves. Pressure tank may be mounted as shown, or on rear bumper.

English Adopt "Toastrack" Tram



Trolley patrons in Blackpool, England, enjoy the fresh air in this new tram car, resembling a huge toastrack.

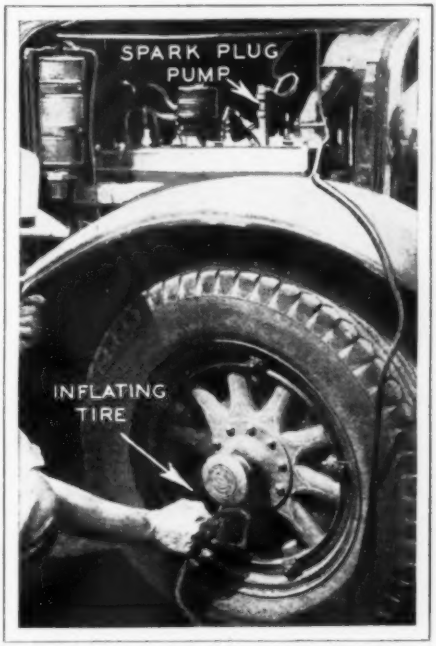
RIDING to work becomes an outing instead of a chore in the new fresh air trams recently introduced in Blackpool, England. Designed for warm weather use, the new trolleys are roofless and combine a streamlined body with the general appearance of a giant toastrack.

Glider Is Towed Across Channel

HAILED as the possible forerunner of future aerial trains, a glider was successfully towed across the English Channel by an airplane. Piloted by a 23-year-old girl, the sailplane made the trip without mishap from Ostend to Heston airdrome, London, first of its kind in aviation history.

Spark Plug Pump Leads Auto Inventions

HAND labor is eliminated with a new tire pump utilizing motor compression. One of the spark plugs is removed and the pump screwed in its place. The displaced plug is connected in a Y of the pump, permitting the cylinder to fire as usual, but other plugs are disconnected. The increased compression of the laboring motor inflates the tires.



Motor running on one cylinder produces great compression which drives air through spark plug pump to inflate tire.

Police Install New Brake Tester

Captain Kennedy of the California highway patrol tests auto brakes with novel one-wheel speedometer and counter.

CALIFORNIA highway patrol officials are testing auto brakes with an ingenious machine. A wheel running alongside of the car drives a recording speedometer and counter which indicates distance necessary to stop the vehicle.

Device Halts Battery Corrosion

Device slips over the battery post, making joint gas-tight.

GUARANTEED to prevent corrosion of battery terminals, a new accessory is now available to motorists. The device fits over the battery posts, forming a gas-tight joint under the terminal which keeps battery acid and gas from coming in contact with the terminal, thus preventing corrosion.

Attach Splash Guards Minus Tools

AN ingenious bracket device locks fender guards in position without tools. These guards prevent splashing and add a modern stream-lined note to the body of the car. They will not rattle or work loose.

Invented by Gar Wood, speedboat king, these splash guards lock in place without the use of tools. Insert right shows how they improve streamlining of the modern car.

FLY fishing and bait casting are the most fascinating sports of the great outdoors and bass and trout are the popular quarry for the fisherman.

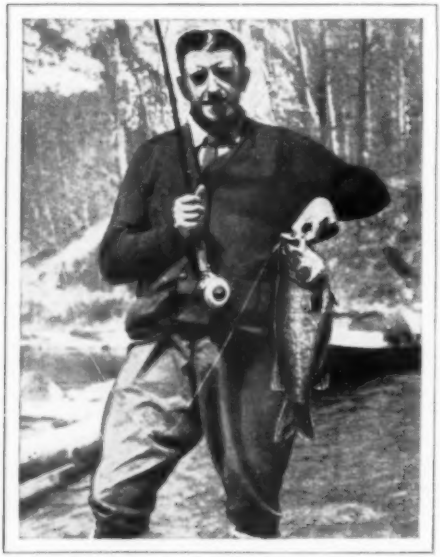
The difference between fishing for trout and bass lies in the fact that trout are taken almost entirely with the fly rod, while bass may be taken both with the fly and the bait rod. Undoubtedly some individuals fail dismally to appreciate the attraction of the fly rod. Such fishermen will find in bait casting everything they desire.

The fact remains, however, that the fisherman who can use both methods gains fifty per cent more out of his fishing than the one who utilizes one method of fishing solely. The reason for this is that whereas one water may be unfitted for the fly rod, you may cast up into the density of the pads with a pork rind lure with a bait rod, where a fly rod would be out of the picture.

Last month we discussed the equipment needed for fly fishing and bait casting. This article will cover the best methods for using that equipment.

While very large worms are used at times in bait fishing for the small mouth bass, in trout fishing a medium sized worm is the best. Put your worms in a box of fine sand mixed with swamp moss and they will scour themselves of the loam inside of them and become light in color, tough of skin, and exceedingly active.

A two-foot length of gut leader is sufficient for bait fishing for trout when using the fly rod. If the water is slow-flowing, no split shot need be nipped onto the leader, but if it is medium flowing to swift or racy the split shot is a necessity. For large brown trout deep down in the pools, you will find a live minnow of four inches excellent. The silvery side of a shiner hooked on a bare hook above which is a spinner on a shaft is unexcelled at times in taking rainbow and other large trout. Use no sinkers on this arrangement, simply letting the



Robert Page Lincoln with a 5-pound small mouth bass. This bass was caught with a fly and spinner combination.

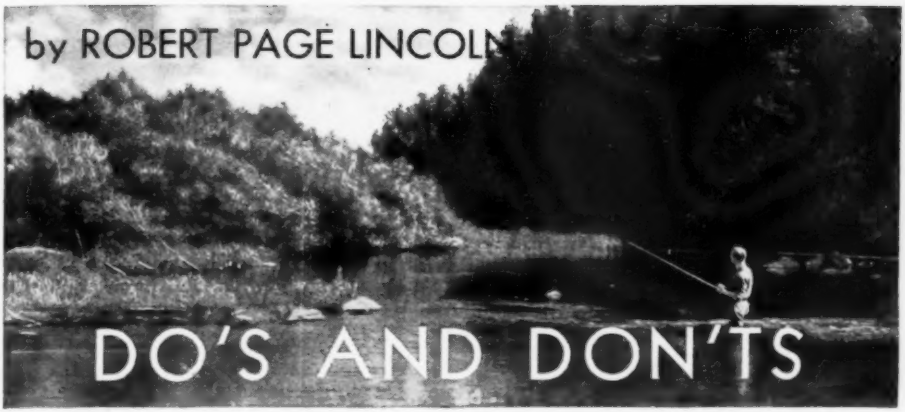
TIPS THAT WILL FILL YOUR CREEL

In fly fishing select flies that resemble flies floating on the water or on bushes overhanging the stream.

Trout are wary. Move quietly along the bank and do not splash through the water. Fish with your shadow behind you.

Never go over the No. 8 size fly for average trout fishing. No. 10 and 12 sizes are the best.

Fish for bass around daybreak and after five in the evening. Bass feed inshore up to 6 a. m. and spend the day in deep water. They return inshore about 4 p. m.



by ROBERT PAGE LINCOLN

DO'S AND DON'TS

bait slip down with the current to weave in and out down the swift runs and into the pools.

Often the bait of this sort let down 75 or 100 feet will take one of the biggest trout of the season. It is especially useful just before and shortly after a rain or, at times, during a rain. The trout are then on the watch for food to be washed down to them by the stream. Place your split shot at least a foot above your baited hook for if the sinker is close to the hook it will the more easily drop the baited hook into the leaves and bottom material.

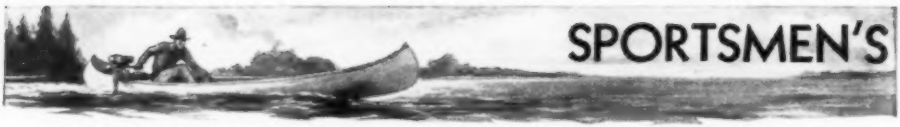
In all trout fishing, bait or fly, observe several very important rules, upon which, by the way, depends your whole success in the game. The first of these rules to observe is to use caution in your fishing. Trout are able to keep in the swim by the sense of hearing and the sense of sight. Your progress along the bank of the stream, even though you are not in sight of the water, may be heard with ease by the trout, and the sound being alien to their surroundings, the possibility is that they pause in their feeding and become suspicious. Move with ease along the bank, even tip-toeing in, and I can assure you that your chances of making a capture are far more certain.

In wading a stream do not splash through the water or make any sound to speak of. Rather push along a step at a time. Your hob-nails grating on the rocks on the bottom of the stream is liable to be heard a great distance and may cause the whole finny population in the pool to suddenly quit feeding and be alert to dangers.

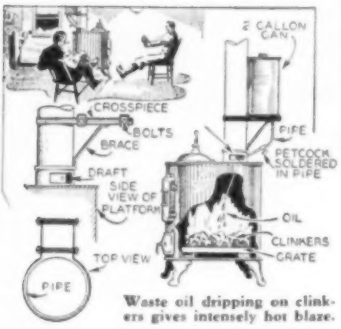
The mere shadow of your rod thrown across the water as you cast is likely to cause every trout in sight to quit feeding. The trout fisherman does well to fish with his shadow behind him.

(Cont'd on page 130)

Bass feed inshore and the best time to catch them is before dawn or late afternoon. In thick pads a pork rind lure is best. At right is a fifteen and one-half-pound large mouth bass caught in the St. Johns river near DeLand, Florida.



Cabin Oil Stove Among Novel Vacation Kinks



Waste oil dripping on clinkers gives intensely hot blaze.

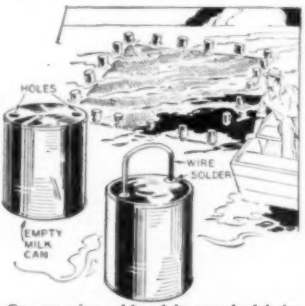
OLD coal stoves or drum heaters which are converted to burn fuel oil will be welcomed by the gang on those rainy, dismal days at the lake cottage or hunting cabin. Used auto crank case oil or regular fuel oil may be burned with very little expense.

First mount the fuel tank a few feet above the stove, supporting it from the stove pipe, or better, placing it on a shelf on the wall. A two-gallon size is about right. Run ⅜" copper tubing from the tank to a point about two feet above the grate. Insert a petcock in the line to control the oil and adjust the heat. Place several large clinkers on the grate. With oil dripping on these clinkers, light with a match to obtain a steady fire.

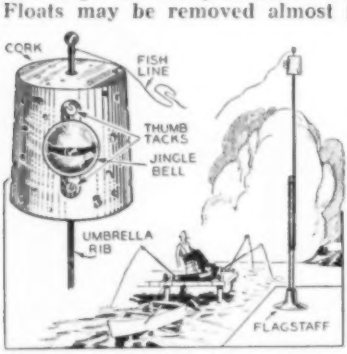
Seine Floats

Where a large number of small floats are needed to support a seine net, the usual wood or cork floats become too cumbersome and expensive. Tin cans of the type used for condensed milk can easily be made into light weight floats which will last a lifetime.

These cans are usually opened by punching two holes in the top. Push loops of heavy copper wire into these holes, and solder the wire in place, sealing up the can. The loops can easily be bent over to hook onto the net. Floats may be removed almost instantly if necessary.



Copper wire soldered in punched holes in empty condensed milk cans makes air-tight seal for light metal seine floats.



Tiny jingling bells attached to cork at tip of fishpole or to pole mounted on dock makes handy nibble alarm where many lines are used.

Nibble Alarms

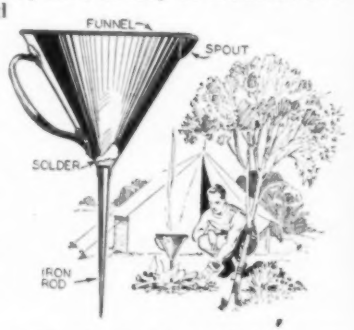
Rather than watch a bobbing cork for hours, waiting for a nibble, many fishermen are rigging up alarms which will signal them when a fish is investigating the bait.

Fasten a small, round "sleigh" bell to a cork with wire or thumb tacks. Impale the cork on an umbrella rib, and attach to the side of a boat, to the pier, or to any convenient support. Tie the fishline to the top of the alarm cork, and listen for your nibbles. Where the line is attached directly to a cork floating on the water, the bell may be mounted on a candy stick pushed into the top.

Coffee Pots

With this funnel coffee pot for the campfire no cumbersome grates are needed, and your coffee will never spill.

Cut off the spout of a large tin funnel about half an inch below the base. Solder a tapered iron rod about 6" long into this opening, being sure that the solder completely seals the opening. This iron rod is pushed into the ground in the center of the campfire to such a depth that the funnel will be just above the coals. The water will prevent the solder from melting. Make a dent on one side of the funnel for a pouring spout, and rivet a piece of strap metal to the opposite side for a handle.



Funnel coffee pot can be poked into campfire in just a second. Pointed iron rod closes the funnel, and makes non-tippable support.

Use a Camera to "Shoot" Wild Game This Summer

by RICHARD K. WOOD

ONE of the most fascinating pursuits the outdoor lover can follow is photographing wild life. Even the amateur with inexpensive equipment can "hunt" animals with a camera and get some excellent "shots."

There is a demand for pictures of outdoor subjects, of fishing and hunting scenes, and many an amateur can find this an interesting side-line.

First consideration is the chief item of equipment, the camera. The average roll-film snapshot instruments are not entirely suitable, mainly because they are fitted with comparatively short focus lenses. There are two types of "still" cameras suitable for wild life photography: the folding hand camera, with focusing panel in the back and the reflecting type of camera such as the popular Graflex. Most advanced workers are wedded to the reflecting camera for these reasons: the "picture" is shown right side up on a mirror right up to the instant of exposure. This feature is a decided aid in composition, and in getting those desirable fleeting glimpses of moving animals; this type of camera is invariably fitted with a "focal plane" shutter, giving maximum speeds up to one thousandth part of a second; and the lens boards are removable, permitting the use of lenses of different focal lengths.

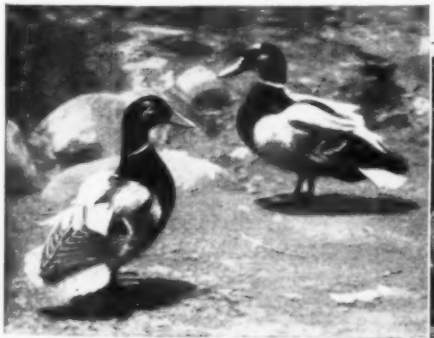
For all practical purposes, an F. 3.5 lens represents maximum practical aperture for "still" hand cameras. Do not consider a lens slower than F. 6.3. "Focal length" is very important, and must be understood by the serious camerist. Standard fitting is a focal length approximating the diagonal of the film; thus a lens of 6½ inch focal length for a 4x5 camera. Now for the best perspective, the focal length should be twice the length of the long side of the film, that is, ten inches for a 4x5. In practice, a lens of 10" focal length gives an image on the film twice the size of that obtained with a lens of 5" focal length, at ordinary distances. Since it is seldom easy to "camera shoot" wild life subjects at close or normal distances, the advantage of the long focus lens is apparent.

Whatever camera you select, if you can afford it, buy at least two lenses to fit the lens board; one equal to, the other double the diagonal of the film.

For the average amateur wild life photographer there are three camera sizes to con-

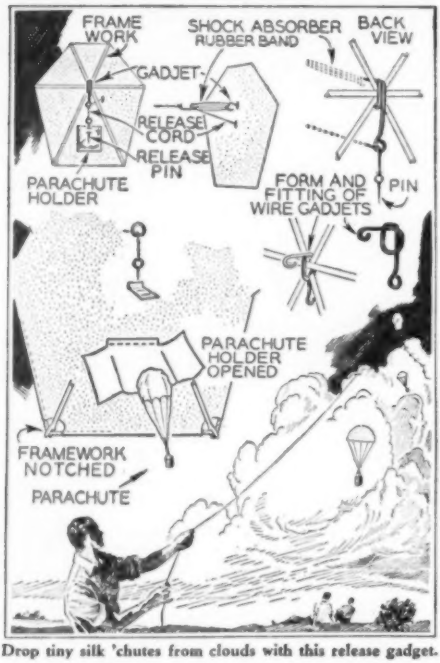
(Continued on page 128)

This weasel was caught in the act of eating a snowshoe rabbit. Below, flash trigger arrangement.



These mallard ducks could not see the camera man. He was hidden some distance away and got this remarkable closeup with a high speed telephoto lens.

How to Release Four Parachutes From a Flying Kite



Drop tiny silk 'chutes from clouds with this release gadget.

IN THIS ideal parachute launching mechanism for kites, as many as four parachutes can be released at once or singly at any desired time, without using any control cord other than the regular kite line.

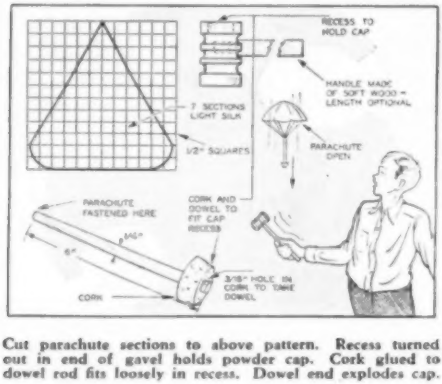
The parachute holder is a paper pocket pasted on the kite, and is held closed by a release pin. When the pin is jerked out, the pocket opens to launch the 'chute.

The release pin is tied directly to the kite line, but a rubber band looped between kite line and a wire bracket at the center of the kite normally keeps a little slack in the release pin cord. Jerking on the line stretches the rubber band, taking up the slack and pulling out the pin.

Where more than one 'chute is to be released, pockets are pasted under each other. Release pins are connected in series with a little slack between each.

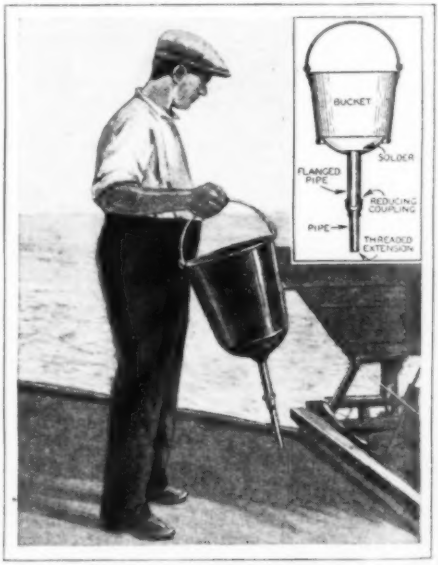
Gavel Projects 'Chute Into Air

SWING this "caterpillar club gavel" down on a stone and watch the projectile sail high into the air, blossoming gracefully into a tiny silk parachute which floats gently to the ground. Extra powerful paper caps such as are used in toy pistols on the Fourth of July speed the projectile on its way. Make the parachute from seven sections of light silk sewed together, and tack the shrouds to the dowel rod. A few feathers may be fastened to the dowel in place of the parachute with just as pleasing results.



Cut parachute sections to above pattern. Recess turned out in end of gavel holds powder cap. Cork glued to dowel rod fits loosely in recess. Dowel end explodes cap.

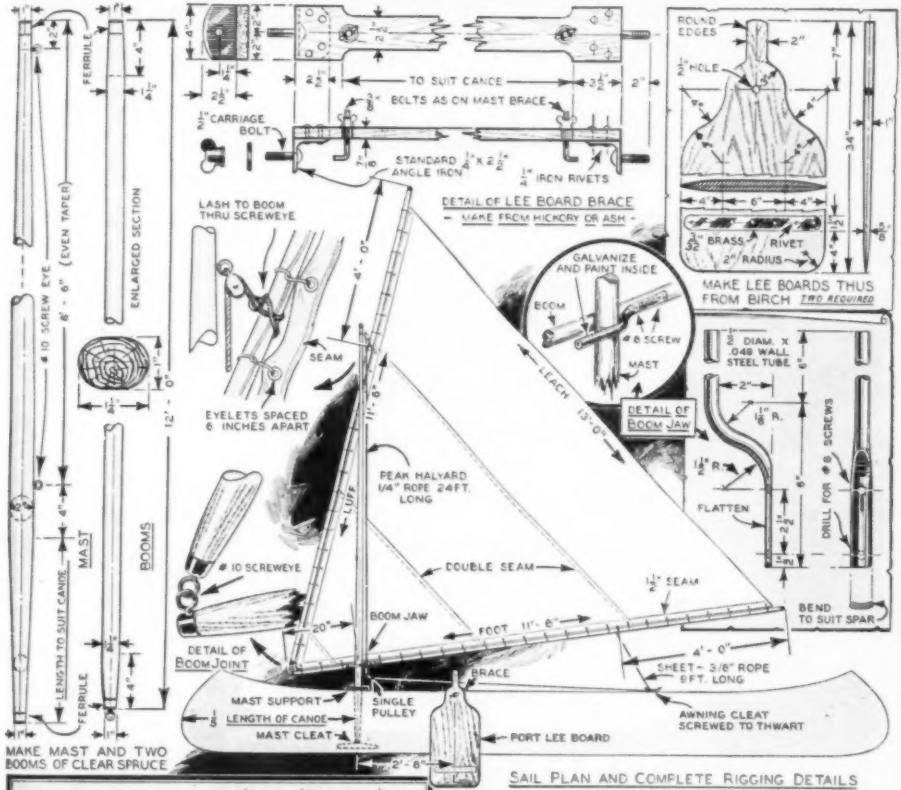
Use Bucket Funnel for Boat Tanks

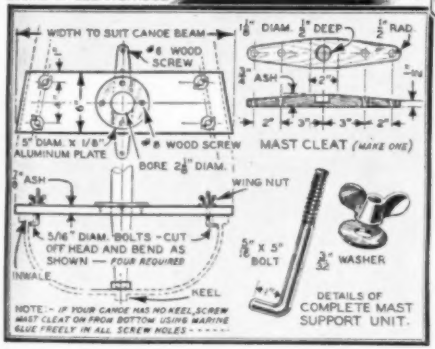


Old fire bucket makes handy gasoline funnel. Solder pipe to bottom of bucket, adding pipe fittings to obtain desired length and diameter. Hang funnel near gas pump.

GASOLINE tank filling holes on boats are notoriously small and inaccessible. By making a large bucket funnel out of an old round-bottomed fire bucket and a few ordinary pipe fittings, large quantities of gasoline can be transferred quickly and safely from pump to boat. The outlet of the funnel can be made to any length and diameter best suited for a particular boat by adding coupling and pipe.

Install this SAIL RIG *on Your* CANOE




WIDTH TO SUIT CANOE BEAM
#8 WOOD SCREW
5" DIAM. X 1/8" ALUMINUM PLATE
#8 WOOD SCREW
BORE 2 1/8" DIAM.
1/8" DIAM. 1/8" DEEP
1/2" RAD.
3/4" ASH
MAST CLEAT (MAKE ONE)
7/8" ASH
WING NUT
5/16" DIAM. BOLTS - CUT OFF HEAD AND BEND AS SHOWN — FOUR REQUIRED
INWALE
KEEL
5/16" X 5" BOLT
3/8" WASHER
NOTE: - IF YOUR CANOE HAS NO KEEL, SCREW MAST CLEAT ON FROM BOTTOM USING MARINE GLUE FREELY IN ALL SCREW HOLES -
DETAILS OF COMPLETE MAST SUPPORT UNIT

Mast support made from 1"x6" spruce or hardwood, in length to suit canoe beam. Wing nuts on clamping screws make removal of mast easy. Use good grade cloth for sail.

Sail plans and construction details of canoe sail shown above.

"CANOE-SAILING" is one of the most enjoyable of outdoor sports. The sail rig is not expensive or hard to make, and can easily be removed when not wanted.

For the mast start with 2" square clear Sitka spruce stock. Taper it down in the square, and then round up the corners. Fit the 1" metal end ferrules carefully and seat them with varnish.

The mast cleat and mast support are cut from the best white ash. Be careful not to bore through the cleat, otherwise the mast will wear through your canoe bottom.

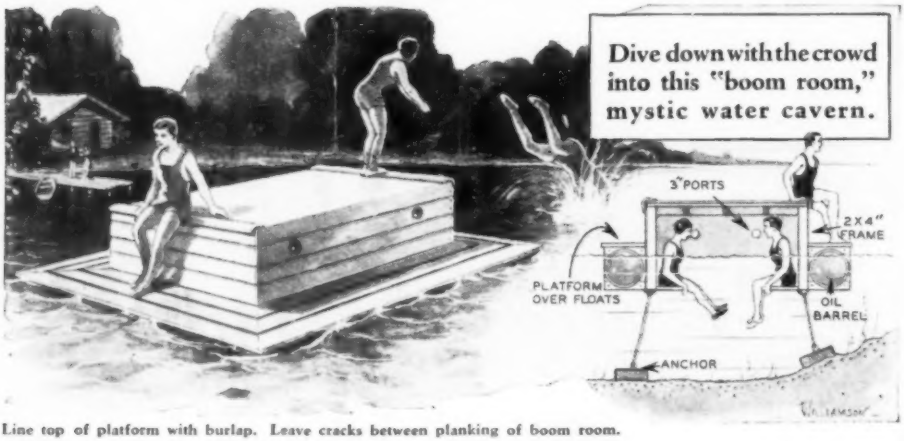
Lee-boards must be used to steady the canoe on turns. Cut them from clear birch and taper the edges carefully. Rivet 3/32" brass strips on both sides of each board to strengthen the blades, using marine glue or white lead in the rivet holes.

Make the lee-board brace in a length to fit your own canoe beam. The end brackets are two pieces of ¼"x2½"x2½"x4" long standard angle iron. Drill the holes, then have the brackets galvanized. Since the lee-boards are often removed, thumb nuts are used on the clamps.

Two carriage bolts serve as pivot arms. Drive them into the brackets, and they will

(Continued on page 132)

Frolic in "Boom Room" Swimming Cave


Dive down with the crowd into this "boom room," mystic water cavern.
3" PORTS
2 X 4" FRAME
PLATFORM OVER FLOATS
OIL BARREL
ANCHOR

Line top of platform with burlap. Leave cracks between planking of boom room.

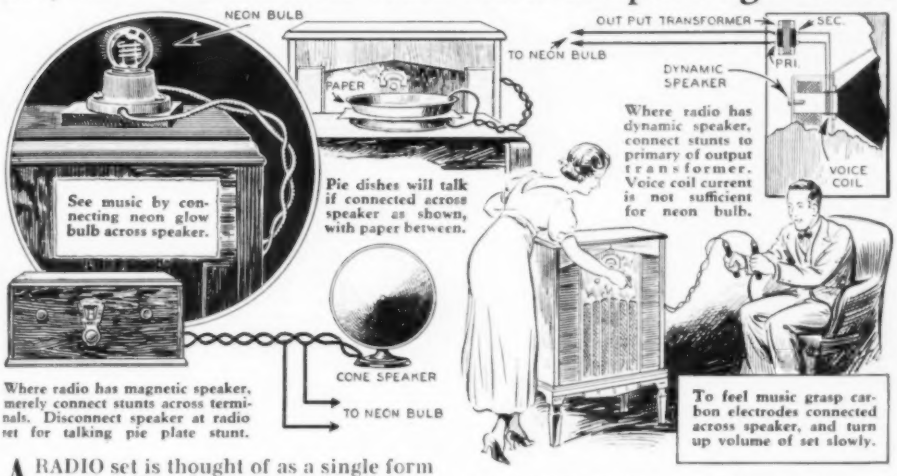
THIS diving platform, though not a bit harder to build than any ordinary floating platform, will declare real dividends in fun. Entertain your guests in the "boom room," an underwater parlor addition to the diving float. Let them dive under to come up in the dim light of the mysterious water cave—there to rest comfortably while enjoying a fish-eye view of the lake bottom. Thrill with them as ordinary conversation booms and reverberates in a deafening manner.

The framework is best assembled on the beach. The planking need not be watertight, since eight steel oil barrels will provide buoyancy. Use galvanized nails to prevent rusting, and countersink the heads of all nails.

Give the entire raft a good base coat of priming grey lead paint, well thinned with turpentine. Give the exterior a good coat of white paint, and paint the interior of the "boom room" black. If you wish, cut out 3" ports in the boom room, plugging with strong glass and putty to complete the nautical effect. Half the mystery and thrill of the room lies in its darkness and seclusion. Do not use spring boards for diving. No floating platform of this type has enough inertia to support a diving springboard.

Almost any kind of old or new lumber will do for the framework. Notch frame pieces to hold oil barrels rigidly in position as shown. Keep the anchor ropes snugged pretty tight up and down to the corners of the diving platform.

See, Feel Radio Music With These Simple Magic Stunts


NEON BULB
See music by connecting neon glow bulb across speaker.
PAPER
Pie dishes will talk if connected across speaker as shown, with paper between.
OUT PUT TRANSFORMER
SEC.
PRI.
TO NEON BULB
DYNAMIC SPEAKER
Where radio has dynamic speaker, connect stunts to primary of output transformer. Voice coil current is not sufficient for neon bulb.
VOICE COIL
CONE SPEAKER
TO NEON BULB
Where radio has magnetic speaker, merely connect stunts across terminals. Disconnect speaker at radio set for talking pie plate stunt.
To feel music grasp carbon electrodes connected across speaker, and turn up volume of set slowly.

A RADIO set is thought of as a single form of entertainment, but actually it is a box of electrical magic capable of performing many unusual tricks.

It is easy to fix up your radio so your friends can see music and feel it, too.

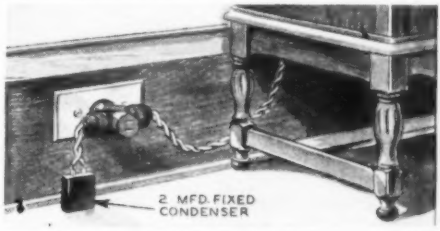
To see music get a half watt neon glow bulb at an electrical supply house. Though this bulb is small, it will screw into any light socket. Connect up the socket to the loudspeaker terminals of your radio. The bulb will glow dim on the low notes and bright when the tones are high, the brilliancy changing continually with the music.

On modern receivers connect the neon bulb ahead of the output transformer, and not to the voice coil leads.

Music can be felt as well as heard. Secure two carbon rods from old dry cells and connect one to each of the speaker leads. Moisten your hands and grip the rods. Have someone turn up the radio volume control slowly. As soon as the music is heard it will be felt. This device is a real shocking machine, so be a bit wary about gripping the handles when the volume is on full blast.

To make pie plates talk, disconnect the regular speaker, connecting the leads to the pie plates instead. Set one dish on a flat surface bottom up, place a piece of tissue paper on it, and set the other dish on next. Turn on the volume control and the dishes will talk!

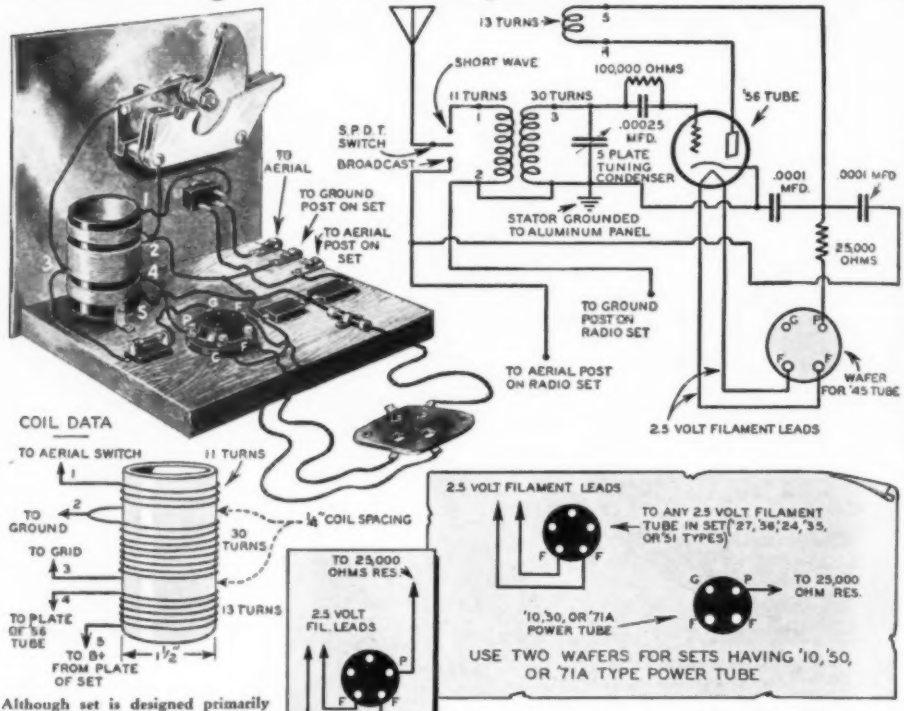
An Emergency Line Noise Filter



Plug in filter condenser as shown to cut down line noises.

WHEN power line noises interfere with clear radio reception, an emergency filter can be rigged up in a minute. Connect a bayonet plug and cord to a 2 to 4 mfd. powerpack condenser and plug into your radio wall outlet. This places the filter condenser across the line.

"Master Midget" Is Very Simple Short Wave Converter



Although set is designed primarily for receiving police calls, excellent results have been obtained on amateur bands as low as 20 meters. Set is easy to build and not at all tricky to operate. No batteries are needed.

Four and five prong wafers made from panel tube bases are used to obtain converter voltages from different type sets.

FLIP over the switch of this little one tube converter and police calls, amateur phone conversations, and airplane broadcasts will come over your loud speaker as you spin the single tuning dial. You don't need any batteries—a tiny wafer which slips under your radio power tube does the trick.

The parts needed can be dug out of the junk box, or salvaged from some old battery set. You will need these: 1½" coil form 3" long, single pole double throw switch, tuning condenser, .00025 mfd. grid condenser, two .0001 mfd. fixed condensers, 100,000 ohm grid leak, 25,000 ohm carbon resistor, 5 prong socket, '56 type tube, 7"x9" metal panel, and 6"x8" baseboard.

The switch may be made by mounting two bolts on a piece of bakelite, and making contact with a slider arm.

Best results will be obtained by taking an old battery set tuning condenser and removing all but 5 of the plates. Leave 2 rotor and 3 stator plates.

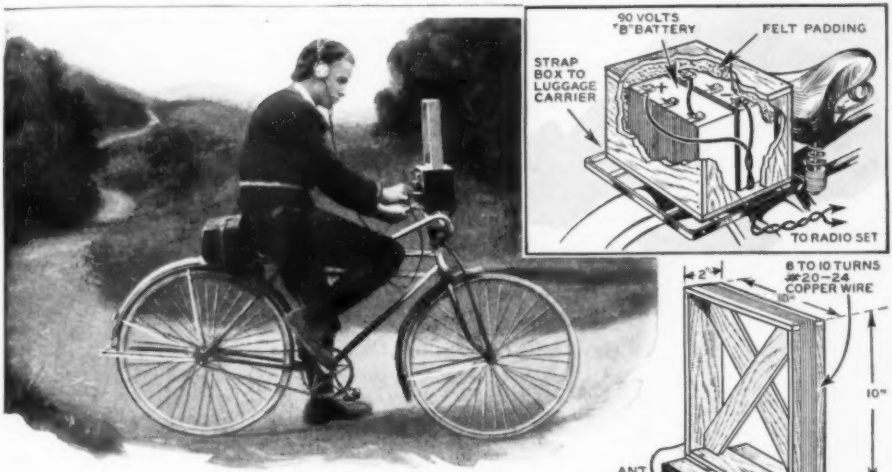
Assemble the parts according to the above circuit, making all leads short and well soldered. Use No. 28 or No. 30 copper enamel wire for winding the coil.

To construct the wafer cut out two pieces of cardboard or thin fibre 1½" in diameter. Mark the exact location and size of the tube prongs, and drill out the holes. Next cut three pieces of thin metal, such as shim brass, about ½" long and 1/16" wide, to set in the holes to be used. Run lead wires between the two discs to these spring contact strips, then glue the discs together.

To operate, change the radio aerial over to the converter, run a wire from the radio ground to the converter ground, and connect the aerial post on the set to the converter. Do not remove the regular radio set ground. Slip the wafer under the proper tube, and move the converter switch to the short wave side. Adjust your radio to about 600 kilocycles (500 meters) and tune the converter very slowly. The regular radio set volume control will operate on short wave programs.

For broadcast reception just throw the switch to the broadcast side. An extra switch may be placed in the filament circuit of the '56 tube to turn the tube off when the converter is not being used.

Enjoy Radio Music on Your Bicycle Tours



Listen to radio music, amateur broadcasts, and keep in touch with world as you tour the country on a bicycle. Any small battery set using new 2-volt tubes can be used.

CAR radios are now quite common, but few indeed are the radio-equipped bicycles. It really is a simple job to rig up the old wheel for radio, though you will have to be satisfied with headphone reception.

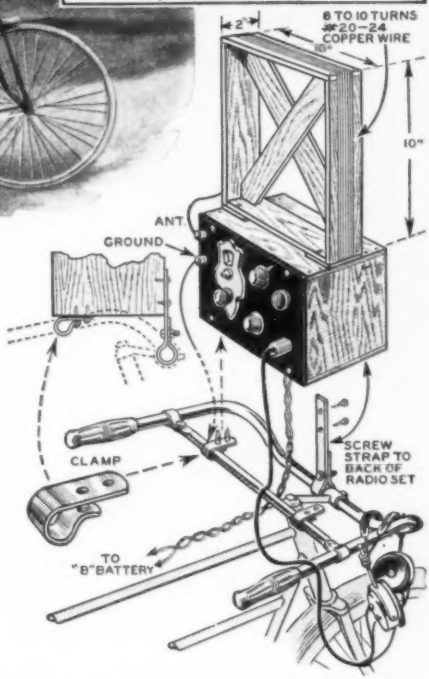
A two tube battery set such as was described in the January, 1934, MODERN MECHANIX AND INVENTIONS will exactly fill the bill. This set is small enough to fit between the handlebars, and will bring in both long and short wave programs as you pedal along. The only change necessary will be to install cushioned tube sockets to take up road shocks.

Make clamps of fairly stiff metal, to fasten the radio set to the handlebars. On bicycles without a crossbar the front clamps can be attached to the handlebars.

A loop antenna wound on a 10" square frame of thin boards is used. Brace the inside of the square with cross members, and boil the entire framework in paraffin for half an hour. Wind 8 to 10 turns of No. 20 to No. 24 insulated wire on the loop, spacing out the turns a little. Paint the winding with melted paraffin, and bolt the antenna to the top of the radio set. One end of the winding is connected to the radio set aerial, the other left free.

Connect the radio ground to the metal part of the bicycle, such as a clamp.

Filament dry cells can either be mounted inside the radio set, or placed in the tool compartment of the bicycle.

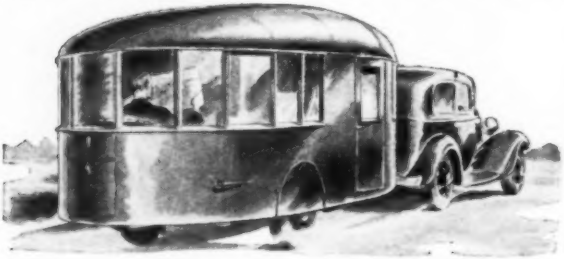


Frame of bicycle is used for radio ground. Loop aerial is mounted on top of radio cabinet, batteries on carrier.

The B batteries may be placed in a waterproofed wood box and strapped onto the carrier in back. Use rubber covered wire wound around the bicycle frame to make connections to the set. Stuff the box with packing to keep the batteries from moving around. Use a good pair of headphones. The volume will not be quite as great as when a long high aerial is used, but local programs will be more than loud enough.

For broadcast reception with the January, 1934, two tube set use 55 turns for both grid and tickler on the lower part of the band and 70 turns each for the upper portion.

Build "ALOHA" Trailer



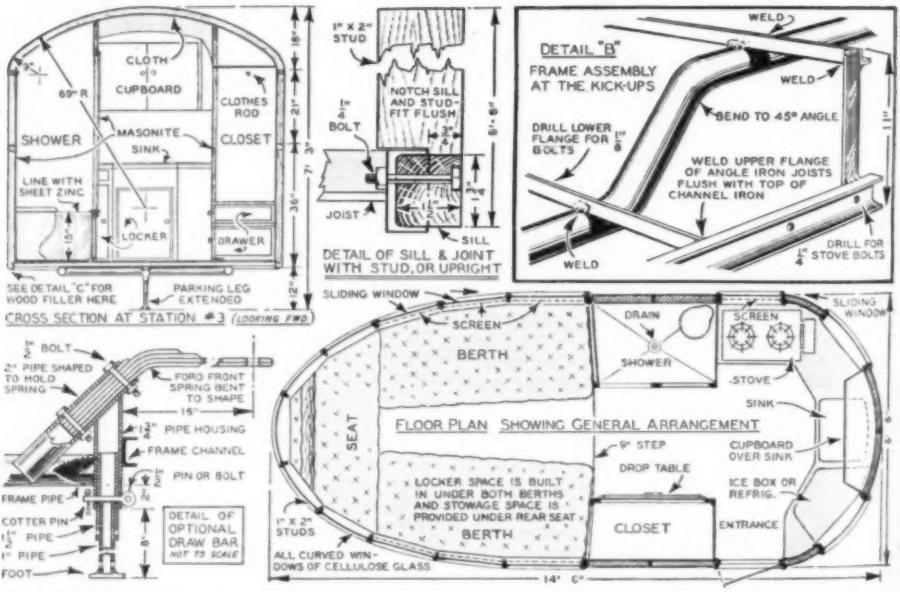
"Aloha" is a real traveling home. Fitted with a shower, berths and a kitchen, it has the best of conveniences, at no great cost and without customary crowding. Part I gives initial details covering construction of the chassis.

PART I

TRAILER season is here. Those who made travel plans during the winter months are certain to welcome any suggestion that will fulfill their dreams in an economical, safe, convenient and comfortable manner. It is believed the "Aloha," trailer de luxe, meets with these requirements.

The writer contemplates an extensive trip throughout the United States and neighboring countries and with this in mind has studied the plans of a good many trailer designs. Practically all of them were safe and built for wear and have served their purpose very well. However, if a trip of any length at all is planned, every convenience possible should be provided to get the most in pleasure and comfort from the trailer. What could be more disappointing in your travels than to find a delightful spot to stop for a while, only to realize you are not equipped for unplanned stop-overs.

A shower is always refreshing and regardless of where you are there are times when you would like a little pepping up. This pleasure may be enjoyed even while you are on the road. Many times there are occasions when something a little nicer than driving or camping togs would be more presentable. The writer has designed this trailer to provide all these conveniences and benefits and many more as will be disclosed later, at a cost that is no greater than the average well designed trailer. Yet *Aloha* is no more difficult to construct.



Floor plan shows shower, closet, stove, sink, refrigerator and berths of well-equipped Aloha. Unusual arrangement provides many conveniences minus crowding. Wood frame is fastened to chassis channel iron with one-fourth inch bolts.

de Luxe for Summer Touring

by **ROBERT W. YORK**

Aloha has the good features of a number of designs with many new ones added, making the completed cabin one of unique arrangement and beauty. You will be proud of this trailer anywhere.

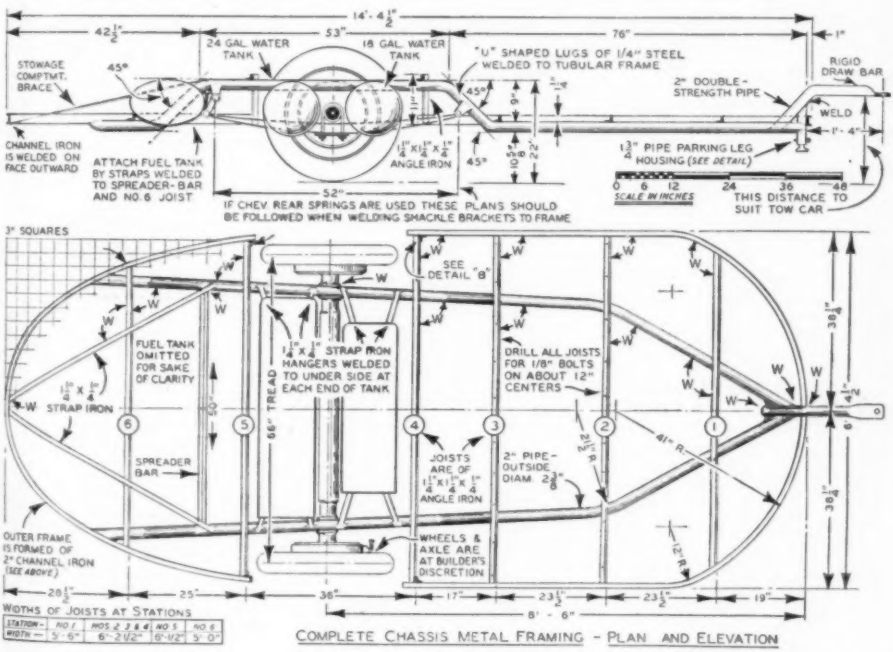
Although this design is not a perfect streamlined job, still every effort has been made to cut down its head resistance and the vacuum at the rear. The roof has also been treated in a similar manner to reduce air friction along its entire surface. All these changes have been made without losing interior convenience or comfort and with these changes it is safe to say that the cost of towing this trailer will be less than 4% more than the cost of running your car.

The chassis has a double bend over the axle to provide a large stowage space at the stern. The road clearance is 12" at all points except at the parking leg which has a minimum clearance of 8". Another feature of this chassis is the added floor length. It has been found that the average floor length in other trailers is 12 feet and the over-all dimension from rear to tip of draw-bar is 15 feet. In this design the floor length is 4'-6" and the o. a. is 15'-9¾". Due to the curved front of the chassis this trailer will allow the towing car to turn in a radius as sharp as that allowed by any other trailer design.

Chassis Made of 2" Pipe

The chassis consists of two 2" pipes having two vertical bends over the axle and one horizontal bend near the bow. The bow ends are brought together and welded to a short length of 1¾" pipe vertically placed with one end 2" below the larger pipes. This vertical pipe is called "parking leg housing," which will later be described. We next weld to the chassis frame before it gets out of line ⅛"x1¼"x1¼" angle iron joists which are spaced and of the lengths indicated. Care must be exercised to see that the joists are at right angles to the center line of the two chassis frames which are separated as shown on the drawings. Two pieces of 2" channel iron are then bent to the curves indicated and welded to the ends of the joists with the upper channel

(Continued on page 124)


14'-4½"
42½"
53"
76"
1"
24 GAL. WATER TANK
18 GAL. WATER TANK
"U" SHAPED LUGS OF 1/4" STEEL WELDED TO TUBULAR FRAME
STOWAGE COMPTMT. BRACE
45°
2" DOUBLE-STRENGTH PIPE
RIGID DRAW BAR
WELD
1'-4"
CHANNEL IRON IS WELDED ON FACE OUTWARD
ATTACH FUEL TANK BY STRAPS WELDED TO SPREADER-BAR AND NO. 6 JOIST
1¼"x1¼"x⅛" ANGLE IRON
1¾" PIPE PARKING LEG HOUSING (SEE DETAIL)
52"
IF CHEV REAR SPRINGS ARE USED THESE PLANS SHOULD BE FOLLOWED WHEN WELDING SHACKLE BRACKETS TO FRAME
0 6 12 24 36 48
SCALE IN INCHES
THIS DISTANCE TO SUIT TOW CAR
3" SQUARES
SEE DETAIL "B"
FUEL TANK OMITTED FOR SAKE OF CLARITY
1¼"x⅛" STRAP IRON HANGERS WELDED TO UNDER SIDE AT EACH END OF TANK
DRILL ALL JOISTS FOR ⅛" BOLTS ON ABOUT 12" CENTERS
1¼"x¼" STRAP IRON
66" TREAD
SPREADER BAR
JOISTS ARE OF 1¼"x1¼"x⅛" ANGLE IRON
2" PIPE-OUTSIDE DIAM. 2⅜"
41" R.
12" R.
OUTER FRAME IS FORMED OF 2" CHANNEL IRON (SEE ABOVE)
WHEELS & AXLE ARE AT BUILDER'S DISCRETION
28½"
25"
36"
17"
23½"
23½"
19"
8'-6"
WIDTHS OF JOISTS AT STATIONS
STATION — NO 1 — NOS. 2 3 & 4 — NO 5 — NO 6
WIDTH — 5'-6" — 6'-2½" — 6'-½" — 5'-0"

COMPLETE CHASSIS METAL FRAMING - PLAN AND ELEVATION

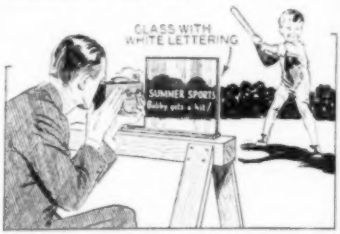
Six cross bars are welded to the two-inch chassis pipe frame. The frame bends over the axle to aid balance of trailer. Lay out the rear curve of body frame by making full size squared plan. Radius of major front curve is 41 inches.

USEFUL SUMMER HANDIKINKS

Tree Stump Is Ideal Bird Bath

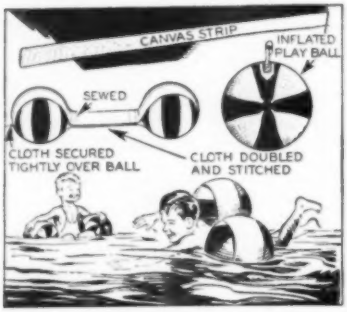
A BIRD bath surrounded by foliage will give more confidence to feathery visitors, and at the same time contribute largely to the appearance of the lawn. When a tree breaks, it can be cut off about 4 feet above the ground, and used as a support for the bird bath bowl. In a short time shoots will spring up to shade the bath and hide the base. Bushes may also be planted around the base.—Harold C. Algyer.

Home Movies



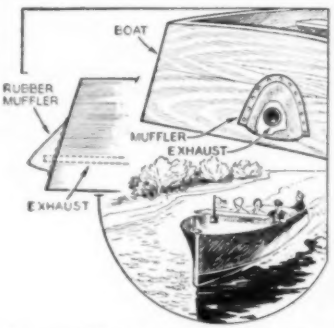
ATTRACTIVE home movie titles, in which the lettering appears superimposed on an action or scenic background, are easy to make. Paint lettering in white on a glass plate, and focus camera on scene through plate.—Ormal Sprungman.

Water Wings



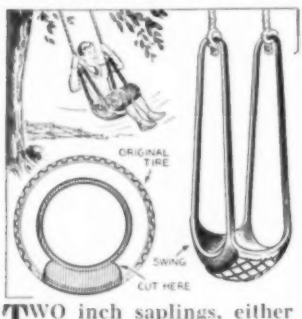
SAFE water wings can be made from two large play balls and a strip of linen. With balls partly inflated pull linen strip around each and sew center portions together as shown in drawing at left. —Chet Sullivan.

Rubber Muffler for Motor Boat



THE exhaust noise on larger cruisers and launches often becomes very annoying. Commercial mufflers reduce the noise to some extent, but they also cut down the speed of the craft. A section of an old auto inner tube tacked loosely over the exhaust pipe will make your boat the quietest on the lake.—Maurice Lonn.

Novel Swing Made From Old Automobile Tire



AN UNUSUAL swing for children can be made from any large auto tire. Cut away the treads from all but a portion at the bottom to be used for the seat. Attach ropes to the beaded parts and swing is ready for use.—Robert Poulson.

Rustic Chair for Camp Is Easily Made

TWO inch saplings, either birch or dead jackpine, can be used for this comfortable rustic camp chair. Fasten the pieces together with nails or wire. The cushion rest is made from a 3' by 6½' strip of awning or burlap, this being sewed to cross piece.—S. I. Ormal.

Giving the CAR a Professional Paint Job

Rub bare spots in old finish to feather edge with "00" grade sandpaper.

Lacquer begins to dry as soon as air strikes it, so keep a "wet edge," never go over the same area twice.

Wipe off dust after sanding with "tack rag" covered with just sticky varnish. Soak soft cloth in varnish.

Above: When using spray brush mask off parts of different colors with newspapers and gummed tape. Spread Bon Ami over windows. Right: Hold spray gun from 6" to 8" from the work.

YOU can give your car a professional paint job—a finish that compares favorably with that of a new car—by carefully following these directions.

It is unnecessary to remove the old finish, assuming it is lacquer. Merely wash the car thoroughly, first with water to remove dirt and mud, then with gasoline to remove grease and wax. It is most important to get all the old wax off.

Using "0" grade sandpaper (320 wetordry), or "00" (400 wetordry), sand every square inch of the car. Sand lightly, but don't cut deeply. If there are bare spots in the old finish, rub these to a "feather edge," tapering off the edges of the spot until they fade right into the metal.

Wash the car free of dust again, and give it one coat of metal primer. Let it dry overnight at a temperature of 70°, longer if the room is colder. Then sand lightly with the fine sandpaper mentioned above to knock off any dirt and dust particles sticking to the primer.

You must next use what the painters call a "tack rag" to remove the fine dust. Soak a soft rag in varnish, wring it out, and let it hang until it is just sticky—neither dry nor wet. When it has reached this state—four hours should do it—go over the sanded surface with it.

Get a good grade of brushing lacquer and a high-grade, 2½" bristle brush. Don't use a dime-store brush.

Have garage floor clean and free of dust. Wet it down with the hose if necessary.

Stir the lacquer according to directions, then strain it through a double cheesecloth. Don't add thinner.

Keep a "wet edge" and never go over the same place twice. If you do, rough work will result, as the lacquer begins to dry when the air strikes it. Blend the strokes, flowing the liquid on heavily enough to cover the first time, yet not heavily enough to "sag" or run. Get some practise on a

(Continued on page 125)

"Skedaddle" — a Simple Boat

This photo shows Skedaddle's fine lines. At right are stem details showing how knee holds stem and keel together.

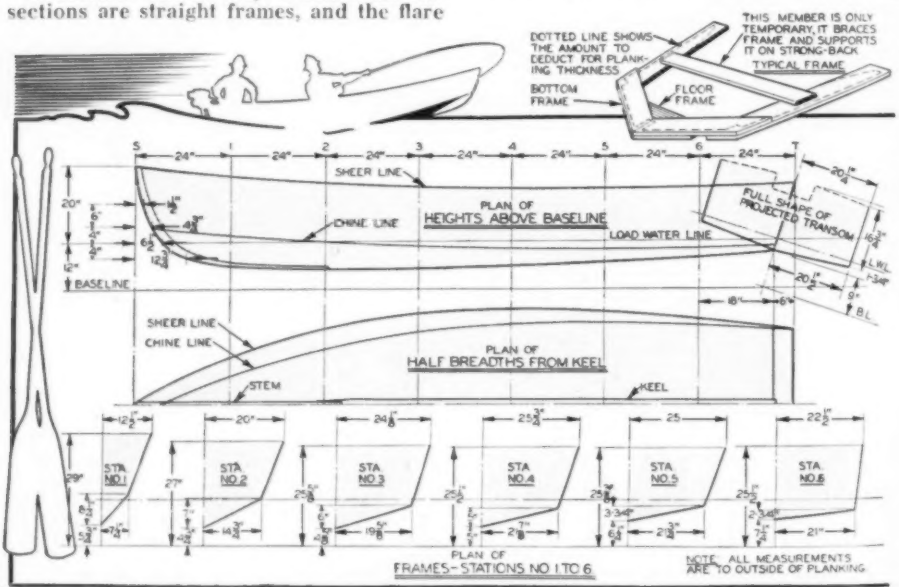
by
WESTON FARMER

"SKEDADDLE" is a dual purpose boat that can be built by anyone who is handy with tools. She is 14 feet long with a beam of 52 inches. She will be lively and will move easily under any outboard motor up to 16 h.p., beyond which it is not feasible or useful to power her, and at the same time she will be easy to row. Not as easy, perhaps, as an out and out rowboat, but for all that fully as easy on the oars as any regulation outboard. To that end she has been provided with thwarts where the balance will be best.

Skedaddle will be easy to build. All her sections are straight frames, and the flare to the bows is carried all the way to the stern, which is sensible, since it keeps the boat dry.

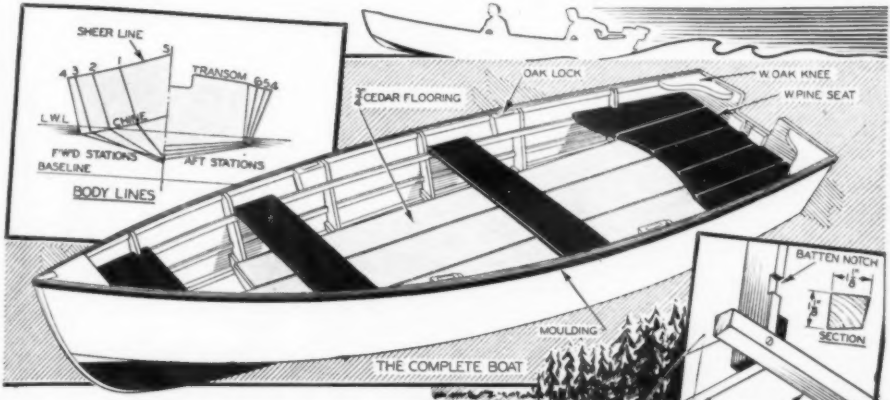
Best of all, the lumber for her building can be had for between fifteen to twenty-five dollars, depending upon your location. The hardware, such as screws and oarlocks, will barely touch five dollars, so that *Skedaddle* is economical to build.

Skedaddle is a general truck horse, a work boat, and an all-around utility boat


DOTTED LINE SHOWS THE AMOUNT TO DEDUCT FOR PLANKING THICKNESS
THIS MEMBER IS ONLY TEMPORARY, IT BRACES FRAME AND SUPPORTS IT ON STRONG-BACK
TYPICAL FRAME
BOTTOM FRAME
FLOOR FRAME
SHEER LINE
CHINE LINE
PLAN OF HEIGHTS ABOVE BASELINE
LOAD WATER LINE
FULL SHAPE OF PROJECTED TRANSOM
BASELINE
PLAN OF HALF BREADTHS FROM KEEL
STEM
KEEL
STA. NO. 1
STA. NO. 2
STA. NO. 3
STA. NO. 4
STA. NO. 5
STA. NO. 6
PLAN OF FRAMES - STATIONS NO. 1 TO 6.
NOTE: ALL MEASUREMENTS ARE TO OUTSIDE OF PLANKING.

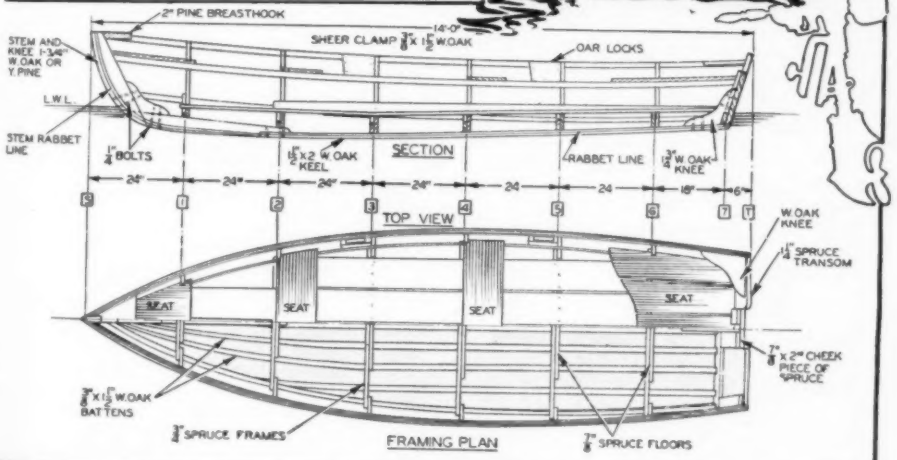
Make your full size plans from these drawings. The outlines of each station will greatly simplify your task. Be sure to deduct planking thickness as shown in typical frame detail above. The six frames are constructed first.

for your OUTBOARD *Motor*

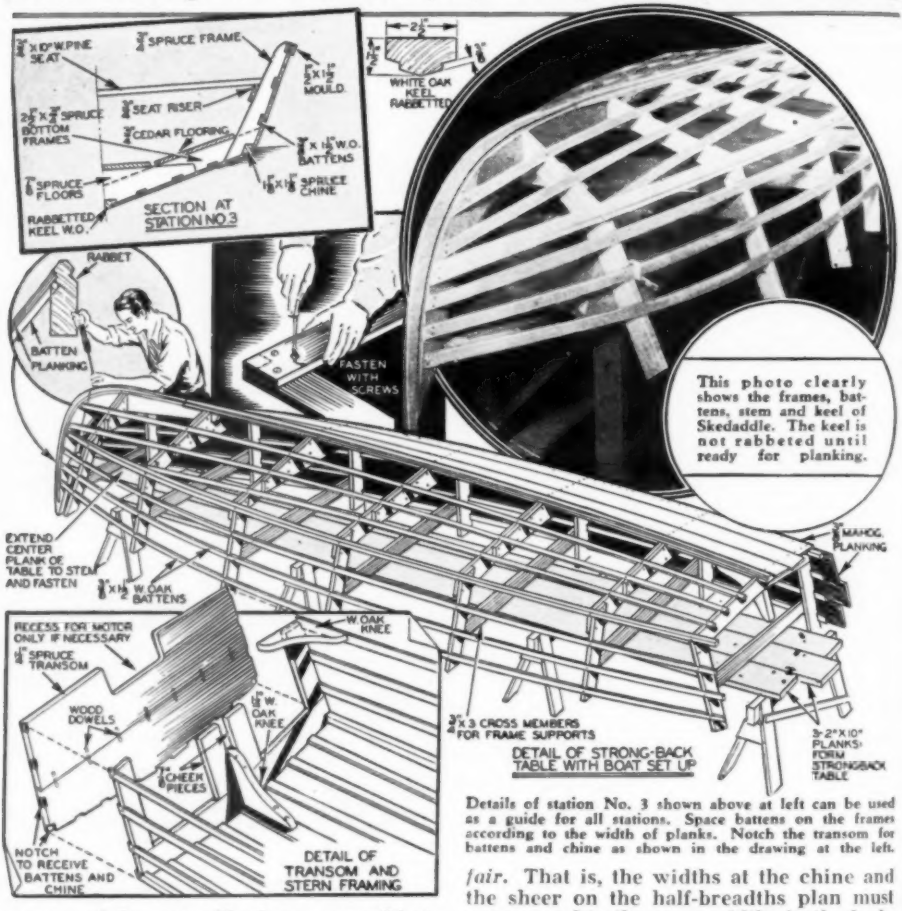


that will be appreciated anywhere. If the motor goes haywire, or you don't have one, she has been given enough of the good old fashioned characteristics of a rowboat so as to row easily.

For ease of building, V bottom was selected. Batten type construction is used, because it has a habit of building itself up easily, so that when you get to the planking stage you have a good husky rigid framework upon which to do your plank fitting. V bottom boats move easily at low speeds, and are drier than the flat bottom type. They are good seaboats. The beam not being excessive they do not have the tendency of following the



The completed boat is shown at top with body lines and chine details. The framing plans will help you follow the steps in construction described in the article. Straight frames and V bottom simplify construction of this boat.


SECTION AT STATION NO. 3
SPRUCE FRAME
SEAT RISER
CEDAR FLOORING
SPRUCE FLOORS
RABBETTED KEEL W.O.
SPRUCE CHINE
WHITE OAK KEEL RABBETTED
RABBET
BATTEN PLANKING
FASTEN WITH SCREWS
This photo clearly shows the frames, battens, stem and keel of Skedaddle. The keel is not rabbeted until ready for planking.
EXTEND CENTER PLANK OF TABLE TO STEM AND FASTEN
W. OAK BATTENS
MAHOG. PLANKING
RECESS FOR MOTOR ONLY IF NECESSARY
SPRUCE TRANSOM
WOOD DOWELS
W. OAK KNEE
CHEEK PIECES
NOTCH TO RECEIVE BATTENS AND CHINE
DETAIL OF TRANSOM AND STERN FRAMING
X 3 CROSS MEMBERS FOR FRAME SUPPORTS
DETAIL OF STRONG-BACK TABLE WITH BOAT SET UP
2"X10" PLANKS FORM STRONGBACK TABLE

Details of station No. 3 shown above at left can be used as a guide for all stations. Space battens on the frames according to the width of planks. Notch the transom for battens and chine as shown in the drawing at the left.

contour of the water like beamy round bottomed outboards, and hence are much easier in their motion in a chop. You'll admire the way *Skedaddle* will behave when it comes on to blow.

The actual building of *Skedaddle* is simple. Be sure you have a fairly level floor big enough to lay down the lines on. Then tack down a couple of widths of building paper on the floor and prepare a good straightedge. You will need a red pencil and a heavy black pencil, the straightedge, a square, a rule, a hammer, inch brads, a chalk line and chalk, and a batten of white pine, say ⅝" by ¾" and at least ten feet long. This will enable you to lay down the lines of the boat full size.

This *must* be done. Otherwise you'll have wobbles and lumps in your boat. Reproduce the lines as close to the dimensions as shown in the drawing, but make them *fair*. That is, the widths at the chine and the sheer on the half-breadths plan must correspond to the same widths in the body plan, and all heights on the body plan must correspond to those on the heights-above-baseline plan. Then you know your boat will be fair. Go at this carefully, for half the labor in building is saved by fairing up correctly.

On a separate piece of building paper transcribe the body plan. That is the chief reason for fairing the boat up—to get the angles on the frames and to see how much has to be cut out for the keel, how much taken off for the planking, etc. The body plan must be "shaved." That is, from each of the lines you have on your full size drawing, the thickness of the planking is deducted. The designer, to get the matters of displacement and weight correct, has to work to the outside of the planking. But in building the actual frames, you subtract the

(Continued on page 127)

HANDIKINKS FOR THE HOME

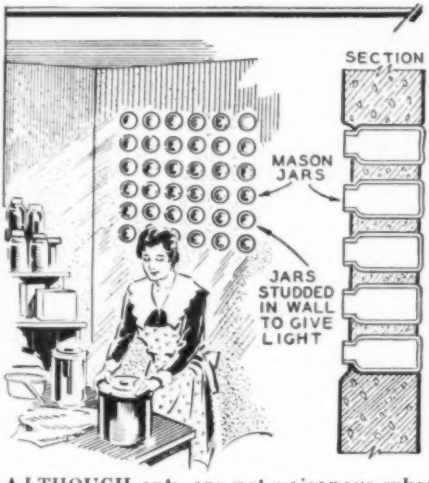
Safety Catches for Poison Bottles

NEITHER color nor shape is a sure protection for bottles containing poisons. Dangerous medicine bottles should be equipped with this simple spring catch which requires that two persons be at hand to open the bottle. Spring steel wire holds the cork tightly in place so that two hands cannot remove cork.—Nellie M. Moore.

Broom Stick Holds Blanket on Auto Seat

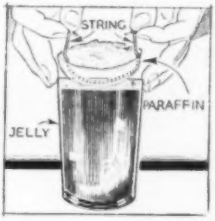
A BROOM stick fastened with rope or straps to the top of the seat of your auto will keep the auto robe from wrinkling, and will in no way interfere with driving. The robe is folded neatly over the wood support, as shown in the drawing at right, and may easily and quickly be removed when needed for covering.—M. M. Culver.

Light Basement With Mason Jars



WHERE outside illumination is desired for the fruit cellar or coal bin, but the cost of windows and frames is excessive, this method may be used. Place mason jars in the concrete forms, nailing boards with holes cut in for the jar covers to the inside of the form. Boards will hold the jars in place until the concrete sets.—B. H. Thomas.

String in Wax Opens Fruit Jars

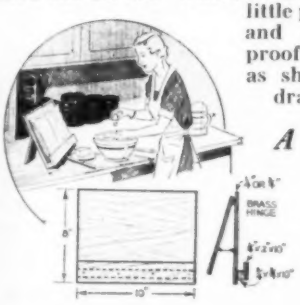


IT IS often difficult to remove the paraffin covering used to seal jelly jars. Imbed a piece of sterilized string in the hot wax seal.—W. V. Gray.

Keep Ants From Food in Summer

ALTHOUGH ants are not poisonous when eaten, no housewife likes to see them swarming over the food she serves. Where it is impossible to keep the little pests out with ant pastes and other chemicals, ant proof shelves may be used, as shown in accompanying drawing.—Geo. C. Jones.

A Cook Book Stand

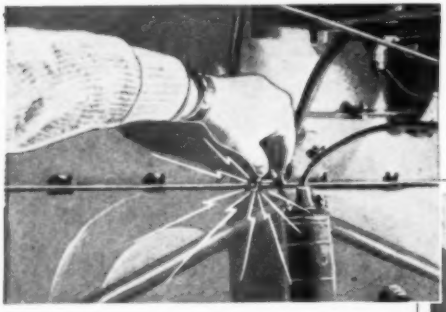


THIS cook book stand will hold the cook book up at an easy reading angle, and keep book open at the desired place. A rubber band may be added if necessary.—W. Farmer.

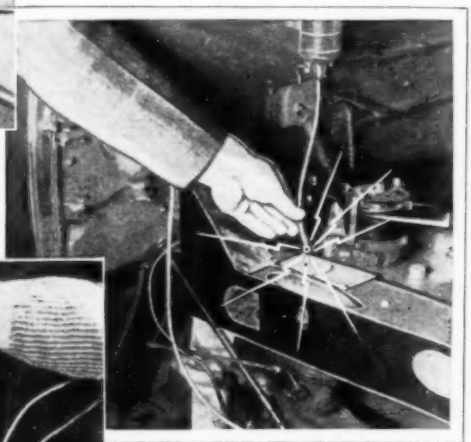
Chasing Electrical Troubles in

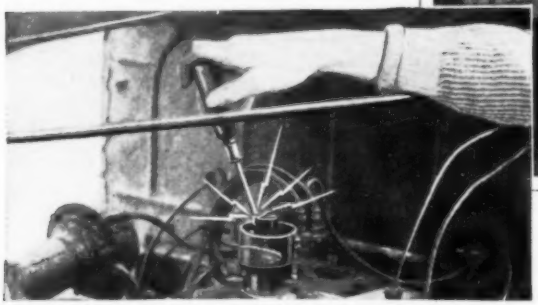
You need only an ordinary screwdriver to trace trouble through the ignition system when your car refuses to start.

by WALTER E. STEWART



TEST PRIMARY circuit with ignition key on. Disconnect coil leads. Spark from one of leads to ground indicates battery-to-coil circuit is OK. Reconnect sparking lead. Spark obtained when other end of coil is grounded to scraped-off part of dash panel shows coil is good.





HIGH-TENSION winding of coil is tested by removing high tension lead from distributor and holding it about 1/16" from engine block. Open breaker points sharply with a screwdriver. Good spark from high tension lead to ground indicates both coil windings are good.

CONDENSER is easily tested. Remove distributor cap. Crank motor until breaker points are closed. Separate points quickly with screwdriver. Bluish spark making popping noise indicates condenser is good. Open condenser gives reddish spark, shorted none.

ELECTRICAL troubles in the auto can be located by anyone in a few minutes, with only a screwdriver for test equipment, if a systematic procedure such as that outlined here is followed.

When the car won't start, the gas supply, the carburetor, and the other mechanical features of the car must first be eliminated as sources of trouble. If there is gas coming to the carburetor and no dirt in the carburetor float or valves, you can almost be certain that the trouble is in the electrical end.

Check the battery first by trying the horn or stepping on the starter. If horn or starter have the usual pep, the trouble does not lie in the battery. A battery can be pretty low and still have enough power left for the ignition circuit, if the starter is not drawing current, so try to start the car by cranking.

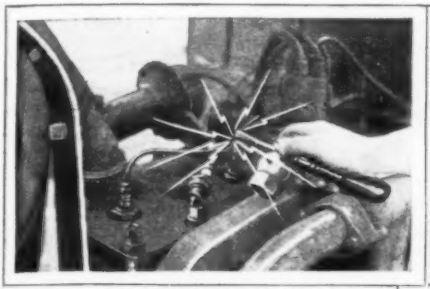
With the condition of the battery known, the primary circuit should next be tested. Disconnect the two primary wires leading to the ignition coil. Turn on the ignition key, and touch each wire in turn to the engine block or some other grounded part of the car. One of the wires should show a spark if the line from battery to coil is all right. If no spark is obtained, then there is either an open circuit or a short between these two points. Look for worn insulation somewhere.

Checking Coil Primary

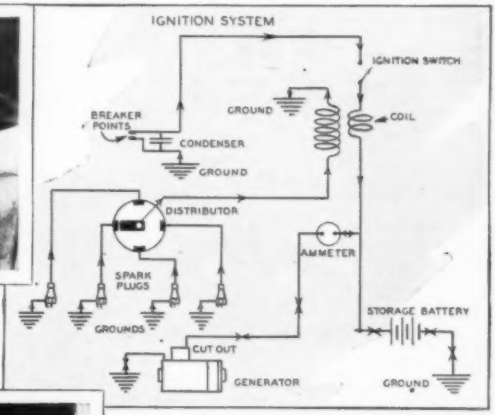
Reconnect the sparking lead to the coil. Now take a screwdriver and try for a spark from the other end of the coil to ground. A spark here indicates that the primary winding of the coil is not open or grounded.

Everything being all right to this point, reconnect the coil and remove the distributor cap. Turn the motor over by hand until the breaker points are closed. Sharply separate the points with a screwdriver, being careful not to touch both points at once. You should obtain a bluish spark which

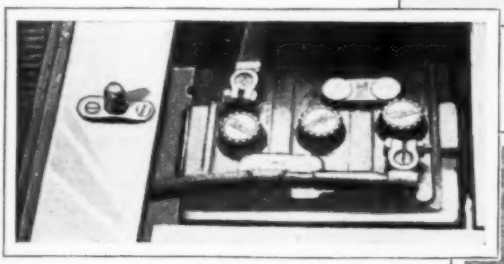
the MODERN Automobile



SPARK PLUGS are checked next. Remove two spark plugs, leaving wires attached, and lay them on engine block. Watch for spark at each plug as motor is cranked slowly by hand or turned over with starter.



BASIC IGNITION CIRCUIT for any modern automobile. Condenser connected across breaker points reduces sparking, lengthens life of contacts. Auto body is the return path.



SHORT CIRCUITS are sure to occur where insulation on any of battery connections wears thin. Watch starter cable especially, since short circuit here will drain battery very rapidly.

PORCELAIN INSULATION on spark plugs may be cracked inside metal case, the cracks not being visible. If motor misses at high speeds and not at low, gap at points is probably too short. If it misses at low speeds and not at high, gap may be too long. Adjust to .027".

makes a popping noise, if the condenser is good.

An open condenser would have caused the spark to be reddish in color—more of a flame than a spark. A shorted condenser would not show any spark at all.

Next remove and clean the end terminals on the high tension wire which leads from the coil to the center of the distributor. Place one end back in the coil terminal, and hold the other end about 1/16" from the engine block. Again opening the breaker points with a screwdriver, a good hot spark should pass from the wire to the engine.

Test Spark Plugs Next

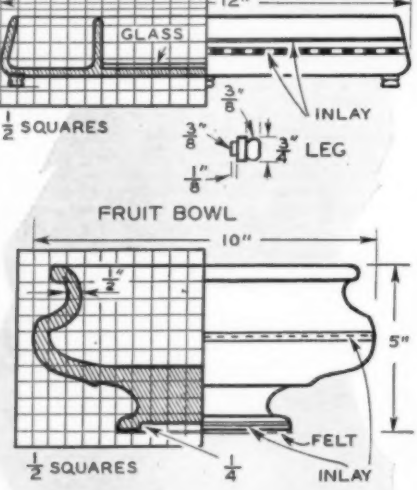
Spark plugs are next in line for the test. Remove two of them, leaving the wires attached and lay them down on the engine block. A blue spark should jump across the gap of each in turn as the engine is cranked by hand or with the starter.

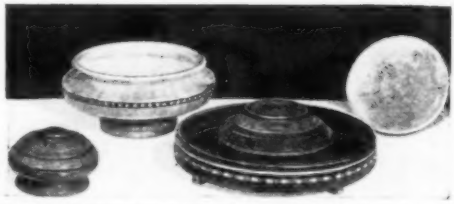
Keeping the two spark plugs about 1/16" from the engine bed, watch for a spark from the metal case to the engine. If one appears here, but not across the points, then the insulation is at fault, and new porcelains are needed. If no spark appears, and none when the spark plug lead is held near the engine bed, the trouble is in the distributor.

Make sure that the little carbon brush in the top of the distributor cap is making contact with the rotor. Clean out all grease in the distributor cap, and look for small cracks. If there are any, scrape out all dirt with a knife.

By following this procedure, you have started at the source and made sure that electricity passed through every bit of apparatus it was supposed to, and stayed out of any place where it wasn't wanted.

Turn Beautiful BOWLS on Small Lathe





Above are the finished bowls, construction of which is given in this article. Inlaid strips are not hard to apply, and greatly improve the appearance of the large bowls.

by **OSCAR E. OLSON**

TURNING out beautiful bowls on a small wood-turning lathe is a fascinating pastime. The projects described here were selected for their design and usefulness.

The Cheese and Cracker Tray is turned from solid stock or from matched, glued material. The tray stock is glued to waste stock, with a piece of heavy wrapping paper in between. Screw the face plate to the waste stock, and turn out the bowl. To insert an inlay, cut a groove which will just fit the strip. Glue the inlay in place. Wrap string around until the glue is set, then sand and polish at high speed.

French polish the tray at the fastest speed of your lathe. This polish is made by mixing one part of linseed oil with three parts of shellac. Sand and finish the bottom of the tray, and glue the four legs in place.

Make Chuck to Turn Cover

Next turn the inside of the cover to fit snugly over the center of the tray. Sand carefully and French polish as before. Rough turn the outside of the cover as much as possible. A piece of waste stock fastened to a face plate must then be turned to just fit inside of the cover, serving as a chuck. Complete the turning, sand, and French polish. Cut a circular piece of glass for the cheese compartment.

The Fruit Bowl is best turned from a solid piece, preferably from a well seasoned burl. A burl is a freak growth found usually on a stump or in the form of a warty growth on the side of a tree. Watch for such burls on your next camping trip.

The Card Tray is made by the glued paper chuck method described above. Select stock with a beautiful grain pattern, such as a well seasoned burl.

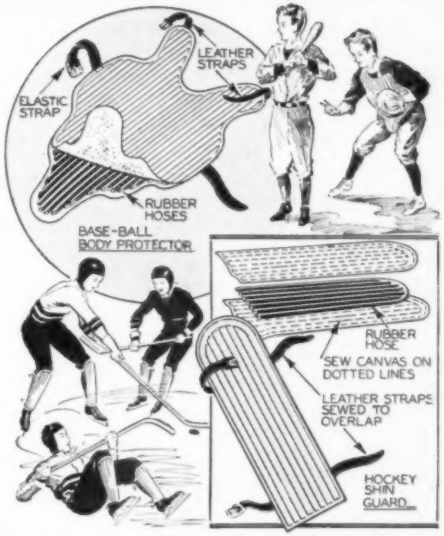
The Powder Box may be turned from a single piece or from composite stock. First turn the inside of the cover on the end of a piece of stock large enough for the entire bowl. Cut off the cover, turn the inside of the bowl, and fit the cover on the bowl.

Make Shin Guards and Body Protectors From Old Hose

RUGGED athletic protectors that will stand some real hard knocks can be made by anyone at little expense. Old garden hose is a good shock absorber, and there are always a few lengths of it lying around. Canvas and thread are the only other materials needed.

Cut the canvas to the desired shape, and lay the cut pieces of garden hose on it, allowing about one inch all around for sewing the hem and attaching straps.

Sew the two pieces of canvas together around each piece of hose, using a sewing machine or doing the entire job by hand. Get strong thread, and wax it before using. Any shoe repair shop will sew your protector for a few cents, doing a job which will stand up for years. Sew either canvas or leather straps into the hem, using two sets of straps for a catcher's body protector, and two for hockey shin guards.



Inexpensive athletic protectors are made from garden hose.

Wind Deflector for Roadster Doors

Sheet aluminum vane mounted on top of roadster doors prevents cold drafts from coming in under wind-vane. Make pattern from heavy paper, and transfer to 3/32" metal.

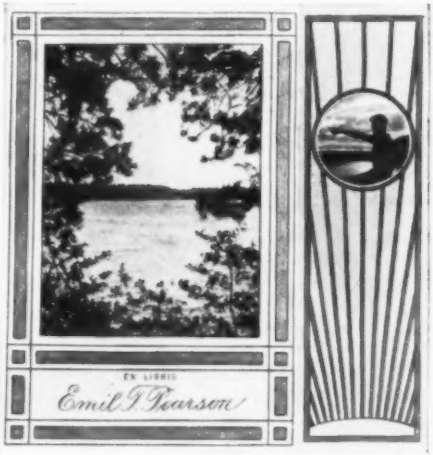
THE roadster type of car is preferred by many for summer driving, but the blast of cold air coming in through the gap between the top of the door and the base of the wind wing can be very uncomfortable in wintry weather.

A wind deflector fastened to the door of the car completely eliminates this cold draft. It can also be used to scoop in just the desired amount of air for ventilation by adjusting the wind wings.

Cut a pattern that will just fill the space from a piece of heavy paper. Lay out this pattern on a piece of polished sheet aluminum 3/32" thick, and cut out. Round off all sharp corners, and bend to a right angle. Mount the deflectors on the top of each door with wood screws, being sure that the wind-wings are inside the deflector.

Use Photos for Personal Bookmarks

BOOKMARKS made by photography can be personal as well as serviceable. Draw up an ornamental design with India ink, leaving space to paste in a personal photo or unusual scenic shot. Photograph the layout and print as many copies as you wish, using a good mat surface double weight paper. Prints can be tinted in attractive shades with transparent colors. Bookplates can be made in a similar fashion.

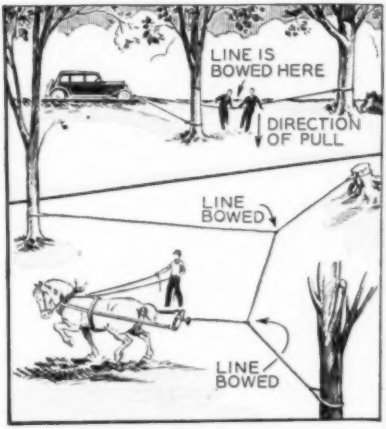


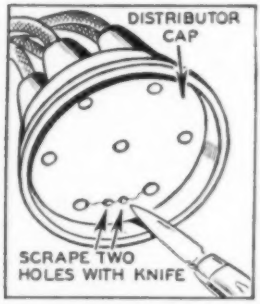
Left: Ornamental bookplate with personal touch made by photographing a layout drawn with India ink. Right: Photo silhouette adds personal touch to this gift bookmark.

Trouble Savers for Autoists

Bow Lever Rope Pulls Cars Out of Mud

BY USING the enormous leverage available in a bow rope arrangement, one man can pull cars out of mud or up embankments, and a team of horses can pull out live stumps. When a car is mired, take a 100-ft. rope, snub it to the car axle, and tie the other end to a tree or pole in the general direction you wish the car moved. Spring the rope in the center like a bow, and you will be able to move the car forward a few feet. If rope is long enough, hold the snubbed end in one hand, and take up slack after each bow movement. A double bow will, of course, give even greater leverage.—C. N. Bruce.

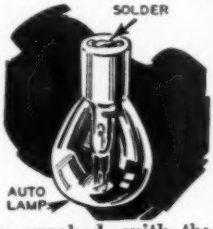




Temporary Repair of Distributor Cap

ON SOME cars, where brush terminals are molded into the distributor cap, the insulating material breaks down and sparks pass between two of the terminals. A temporary repair can be made by locating the fine line visible along the path of the spark and drilling two holes along this path.—M. M. Culver.

Using Burned Headlight Bulbs



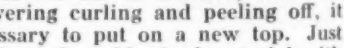
WHEN one of the filaments of the regular double filament headlight bulbs is burned out, there is no need to throw the bulb away. The bulb can be still used for the stoplight by flowing a little solder across the two contact points on the base.—V. T. Jensen.

Use Blowtorch to Fix Cracked Auto Tops

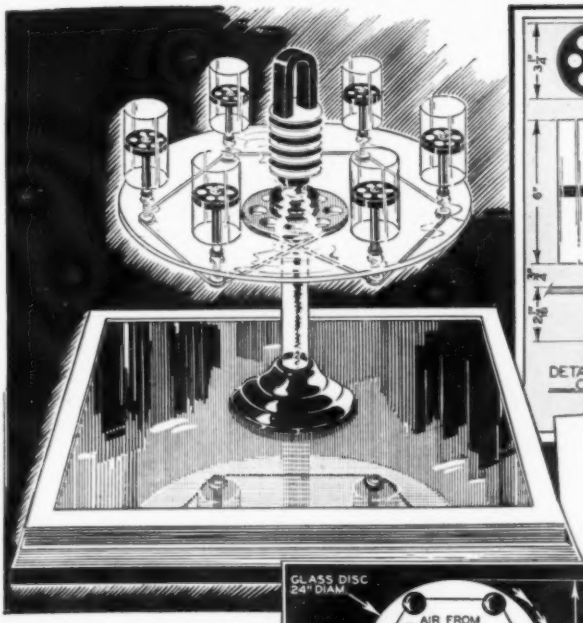
WHEN the top of the car is cracked, with the leatherette covering curling and peeling off, it is not at all necessary to put on a new top. Just apply heat carefully to the rubberized material with an ordinary blowtorch, working slowly back and forth. The heat will make the curled leatherette straighten out and adhere to the cloth again. When the top is cool, smooth out the tiny blisters that have formed with coarse sandpaper or emery cloth. Wash off all grit with gasoline, apply a number of coats of a good top dressing.—Robert Allen.

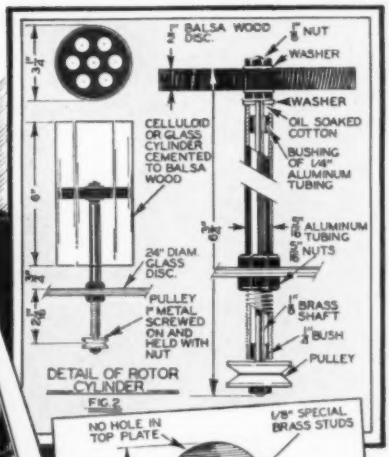
Coil Makes Emergency Ignition System

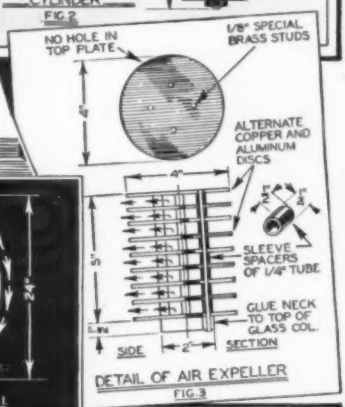
IGNITION trouble in a car is never pleasant, especially if the night is dark and stormy. With this emergency ignition system, which is nothing more than a Model T Ford coil, any car can be brought in under its own power. Mount a Ford coil in a tin or wood box, drilling holes for three wires on one side. The bottom terminal of the coil is connected to the hot or positive side of the battery, the lower side terminal to frame of car, and the top terminal to the center of the distributor cap in place of the regular high tension wire. Be sure the coil points are clean and properly adjusted.—B. Frank Feigle.

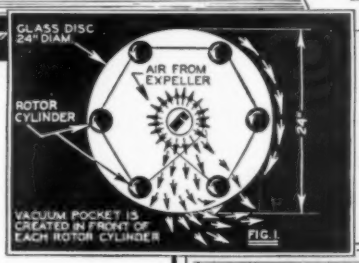

HANG COIL FROM RADIATOR BRACE ROD
COVER GIVES ACCESS TO VIBRATOR POINTS
TO "HOT" BATTERY WIRE
TO CENTER OF DISTRIBUTOR
CLIP TO FRAME OF CAR

Build This Mysterious "Perpetual" Rotor









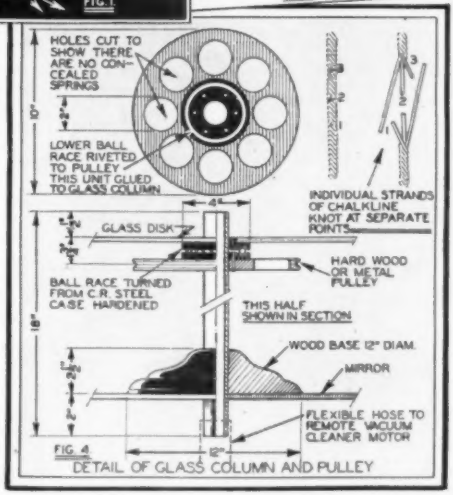
by **DICK COLE**

To the average onlooker this queer gadget appears to be a successful perpetual motion machine. Cylinders of celluloid spin around as a large glass disc revolves slowly, with no visible driving force. Glass support shows there are no wires or springs.

THIS easily built machine, displayed in a store window or at any gathering, will set people to asking "what makes it run?" There is no visible source of power, yet the cylinders and discs spin merrily around.

Alternate copper and aluminum discs in the center, with a permanent magnet perched on top, suggest some new form of magnetic drive.

The Magnus "rotor effect" is the secret. The supporting glass column is hollow, with a flexible hose running from the concealed lower end to a vacuum cleaner in some remote location. The air stream coming out between the metal discs reacts with the air near the surfaces of the spinning rotors in such a way that all rotors are pushed in one direction. Thus, when the wheel is once given a spin, it will continue rotating as long as the air blast is on. The pressure of air is so small that it cannot be felt outside the rotors.


HOLES CUT TO SHOW THERE ARE NO CONCEALED SPRINGS
LOWER BALL RACE RIVETED TO PULLEY THIS UNIT GLUED TO GLASS COLUMN
INDIVIDUAL STRANDS OF CHALKLINE KNOT AT SEPARATE POINTS
GLASS DISK
HARD WOOD OR METAL PULLEY
BALL RACE TURNED FROM C.R. STEEL CASE HARDENED
THIS HALF SHOWN IN SECTION
WOOD BASE 12" DIAM.
MIRROR
FLEXIBLE HOSE TO REMOTE VACUUM CLEANER MOTOR
FIG. 4
DETAIL OF GLASS COLUMN AND PULLEY

Cutting and boring holes in glass disc is only difficult part of entire project. This work can be turned over to glazier.

Planning That North Woods Log Cabin

Here are labor and cost saving hints that will simplify the construction of the wilderness retreat. If you are planning a cabin, these kinks will be welcome.

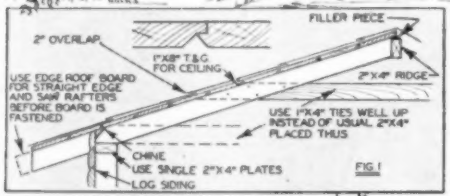
THIS is the season when the inner urge in every man sends him to the catalog shelf to plan for that hideaway on some pine-covered northern lakeshore.

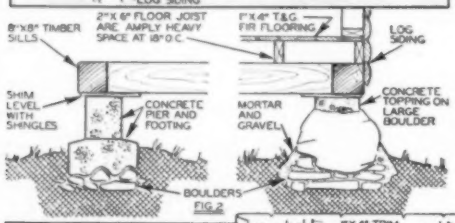
When a man starts planning cabins, he naturally thinks of log cabins. These are fine—if you go at it right. But the trees must be on the site of building or near it, and they must be plentiful and of uniform size. Otherwise a log cabin will cost far more than the conventional boarded cabin. The logs should be coniferous: pine, spruce or some other evergreen which can easily be peeled when felled. This peeling is essential or the wood will be eaten away with termites—boring worms. The trees should be felled in the spring of one year, allowed to season, and be erected through the fall and winter by some local laborer who will contract to do the whole job for a lump sum.

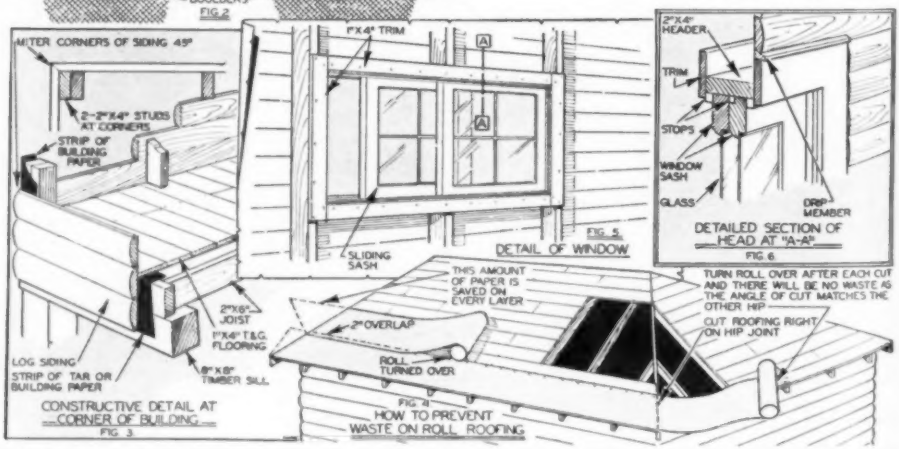
In general the frame type of cabin, either plain siding or with long siding, is far tighter, lighter, cheaper and cleaner.

The one best floor for such a cabin is fir. It does not shrink or swell much, hence is

(Continued on page 120)


FILLER PIECE
2" OVERLAP
1"X8" T&G FOR CEILING
2"X4" RIDGE
USE EDGE ROOF BOARD FOR STRAIGHT EDGE AND SAW RAFTERS BEFORE BOARD IS FASTENED
USE 1"X4" TIES WELL UP INSTEAD OF USUAL 2"X4" PLACED THUS
CHINK
USE SINGLE 2"X4" PLATES
LOG SIDING
FIG. 1





Building costs are kept down by using single rafter plates, horizontally placed window frames, and double surface roofing.

Harvard - Yale Windmill Is Very Lively Garden Novelty

ENDLESS hours of fun are in store for the builder of this Harvard-Yale boat race windmill. The two gaily colored shells will race for hours, each holding the lead for a few minutes. The flaying arms are even more effective than a scarecrow for the back yard or garden.

The two shells are set at a 15 degree angle on the cross arm. The axle for the flapping arms should fit quite loosely, and be lubricated with soap and lead pencil graphite.

Use white pine wherever possible on windmill. Set boats at 15° angle. Finish with varnish, enamels, and black shellac.

Make Bubbling Fountain on Pump

Hole drilled in top of pump spout does not interfere with ordinary pumping, but makes convenient bubbling fountain.

A VERY convenient bubbling fountain is easily made for any farm pump. Drill a quarter inch hole in the top of the spout. To use the fountain, place left hand over the regular opening at the bottom of the spout and work pump a few times.

Electric Pad Heats Photo Tray

AMATEUR photographers often have trouble in keeping developing solutions at the proper temperature on cold days. An electric heating pad placed under the developing tray will serve admirably. Place sheets of newspaper between pad and tray to adjust temperature of developer. A sheet of oilcloth will prevent damage to heater if hypo is spilled. A thermometer should be kept in the tray.

Electric heating pad placed under tray keeps developing solutions at correct temperature. Adjust amount of heat by adding sheets of paper under tray.

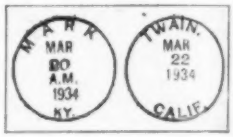
Collecting Starfish Is Very Interesting Seacoast Hobby

Mary Hutchinson, of Venice, Calif., collects odd starfish.

A COLLECTION of starfish may not be especially appealing to most people, but to Mary Hutchinson of Venice, California, it is just as interesting as any collection of stamps. She gathers odd specimens daily on California beaches.

Spell Your Name in Postmarks

POSTMARKS spelling out the names of friends are interesting and easy to get. Cut up stiff cardboard to the size of postcards. Stamp and address cards, and send them to postmasters for cancelling. Names of postoffices are in "Postal Guide."



Air Liners on Egyptian Stamps

MONSTER air liners of the twentieth century form the central designs of a beautiful set of stamps issued by Egypt recently.

The three major types of aircraft are represented. A modern multi-motored air liner soars over an oasis in the desert; a Dornier seaplane cruises high above the Nile; and the long, sleek Zeppelin floats majestically above the mystic city of Cairo. This set of stamps was issued to commemorate the International Congress of Aviation held at Cairo.

"Painting" With Scraps of Paper

RICHARD BOLESLAVSKY, Hollywood movie director, and his wife scorn oil colors or paint brush for their art work. Their unusual paintings are made by pasting together thousands of scraps of gaily

(Continued on page 116)

Movie director Richard Boleslavsky and wife "painted" this picture with paste brush and gaily colored paper scraps.

Ride a
HARLEY-DAVIDSON

Great Sport
-AND COSTS SO LITTLE

BREEZE over trail and highway on a mighty Harley-Davidson—there's *sport* for you!

Feel the surge of eager power in that great Fighting Heart Motor —36 "horses" rarin' to go. Leave traffic and trouble far behind as you whirl away on glorious vacation tour or week-end trip.

You *can* afford it — for motorcycling is everyman's sport. It costs next-to-nothing!

See how you save

Records of total operating cost below one cent (1c) per mile are frequently reported by Harley-Davidson riders — this includes all items of upkeep.

A Harley-Davidson is easy to buy, too. Ask your nearby Dealer about his Pay-As-You-Ride plans — and let him show you how easy it is to learn to ride a Harley-Davidson. See him soon!

MAIL COUPON

HARLEY-DAVIDSON MOTOR CO., Dept. MM, Milwaukee, Wis.
Interested in Motorcycling. Send illustrated literature.
Postage Stamp is enclosed to cover cost of mailing.

Name.....

Address.....

My age is ☐ 16-19 years, ☐ 20-30 years, ☐ 31 years and up, ☐ under 16 years. *Check your age group.*

"Painting" With Scraps of Paper

(Continued from page 114)

colored papers. A great deal of patience was required to obtain the delicately shaded details of the painting without overlapping the scraps of paper too much.

Envelope linings, colored tissue paper, colored cellophane, and many other materials were used in making this painting.

Film Stars Join Home Movie Club

A "STAR'S Camera Club" open to movie celebrities who are also 16 mm. home movie fans has been formed in Hollywood by Louis Lewyn.

The club will meet once a month at the home of one of the stars to project pictures shot by the members. Lewyn offers to run the best shot of each month as a feature of his "Hollywood Parade," and to give an award at the end of the year.

3 Languages on Palestine Stamps

Palestine stamps show scenes sacred to Jews and Moslems.

THE three major races of Palestine are equally well represented on the current stamps, for lettering is printed in English, Hebrew, and Arabic.

The 2 mil stamp shows the "Tomb of Rachel" and the 5 mil the "Tower of David" of Biblical days. The 8 mil shows the Moslem Mosque which now encloses the famous "Dome of the Rock." Next to Mecca this is the holiest site in the Moslem religion.

ADLETS FOR HOBBYISTS

STAMPS

CAICOS ISLANDS—Also early United States, Uganda, Congo's, Nicaragua, Monte Carlo, Niger Coast, Canada, Newfoundland, and Ubangi — "Countries Collectors Haven't Got"—Free for 5c postage. Hurry for yours, Now. Empire Stamp Company, Dept. M.M., Toronto, Canada.

CHOOSE Your Premiums! Jungle stamps! Animal! Bird! Airmail! Triangle and Map stamps! Pick any ten from our big approval selections. Inclose 5c postage. Stamp Importers, Akron, Ohio.

COLOSSAL deLuxe collection, Canada and other rare British Colonials, including pictorial commemoratives, only 10c if you desire our Super Approvals. Swalley Stamp Service, 1119 Trenton, Los Angeles, California.

HIGHEST Cash prices paid for your stamps. Doake, Fresno, Ohio.

STAMPS! 100 diff. 2c; 500 diff. 35c; 1,000 diff. 90c. Tatham Stampco, D9, West Springfield, Massachusetts.

STAMPS Sent on approval. 50% discount. Fred Herzberg, 197 Grantley Ave., Elmhurst, Illinois.

ALBUM, 4100 spaces; 1000 hinges; 215 different foreign; 20 airmails; 25 Japan; tweezers. All for 50c postpaid. Burtis Co., Saratoga, N. Y.

FREE! Gorgeous Packet; including Spanish airpost set, triangle, ship and map stamps, only 3c postage to approval applicants, Imperial Stampco, Fontana, Calif.

200 DIFFERENT stamps 15c. Free list, 600 different packages, Michael 3835m Maypole, Chicago.

CASH Paid for Stamp Collections and accumulations. Royale Stampco, South Pasadena, Calif.

PREMIUMS, with approvals, 3c postage. Harold Bowen, Fort Dodge, Iowa.

AIR Mails from Brazil, Chile, Colombia, Ecuador and Mexico, all for only 10c with our double premium Penny Approvals. Progress Stamp Service, Franklin Park, Ill.

MAMMOTH Mystery packet of rare stamps, for only 10c to serious approval applicants, also valuable free premiums with every selection afterwards. Our stamps are better and our service is different. Fair-Play Stamp Service, 1217 Browning Blvd., Los Angeles, California.

GIVEN, 3 Rare Triangles, and package 200 different for only 10c to approval applicants. Harris, Box 21E, So. Hanover, Mass.

MAKE Money and get your own stamps free! selling "Champion" packets and sets. Send ten cents for samples and plan. Walker, 627 South Olive, Los Angeles, Calif.

FREE!!! Russia Ethnographic Set. Postage 3c. Roberts, 901T Fourth, Bay City, Michigan.

30 DIFFERENT U. S. including 15 commemoratives, air mail, etc., to approval applicants, only 10c. 25 different unused U. S. commemoratives or 40 different used U. S. commemoratives, only $1.00. Fine condition. Also fine foreign stock. Write today. Mabel Hoehn, Stamp Shop, 816 Holland Bldg., St. Louis, Mo.

100 ALL Different hi-value packet for dime and 3c stamp. Mercantil Stamps, Ventura, Calif.

100 ALL Different U. S. stamps, including values from ½ cent to $1.00 and commemoratives for 75c money order. Howard Weaver, 907 Fletcher St., Chicago, Ill.

105 DIFFERENT, including Hyderabad, Travancore, Inini, Congo, Guinea, etc., 3c to approval applicants. Extra—Airmail Set Free if you act quickly. H. Humiziker, Jordan, Minnesota.

RARE TURKEY—Only eight-sided stamp in the world included in "Surprise Packet" only 10c with startling double premium approvals. Bargain stamp service, 1330 South Hope Street, Los Angeles, California.

COLOSSAL Offer—15 mint blocks, 10 imperforates Free. 25 air mails, 50 used U. S. commemoratives, etc., 50c. Byrd stamps used for postage. Albert C. Butzen, 7431 Gratiot Ave., Detroit, Mich.

HEADQUARTERS—Penny Approvals. Lowprice Sets. Individual Selections. Elyria Stamp Company, 437M. Elyria, Ohio.

COINS

FREE!—Foreign coin, banknote, and large illustrated coin catalogue,—4c postage, Souvenir California gold quarter size 26c; ½ size 53c; both 65c! Round or octagon, set of each $1.30! Approvals with each order. Tatham Coinco, West Springfield—9, Mass.

I BUY 1919 and 1922 pennies. Send dime (coin) for valuable coin folder. Walls, 318 West 71 Street, Los Angeles, California.

OLD MONEY Wanted. $5.00 to $2,500.00 each paid for old coins. Buying catalog 10c. Robert Cohen, Box 483, Muskogee, Okla.

HIGHEST Prices paid for Indian head pennies. Send dime for list of those wanted. Coin Shoppe, Box 407-MM, Ottawa, Ill.

COINS, California gold quarter size 27c; ½ size, 53c. 3c piece and coin catalogue, 10c. 200 different stamps and stamp catalogue, 10c. Norman Shultz, Salt Lake City, Utah.

$5 to $500 EACH paid for Old Coins. Keep all old money. Get posted at once. Send 10 cents for Illustrated Coin Value Book 4x6. Guaranteed Buying and Selling Prices. Coin Exchange, Box 17, Le Roy, N. Y.

Radio Power to Revolutionize World

(Continued from page 42)

that my rotating field and induction motor and the wireless system I have given to the world will live long after I have gone.

You ask me about atomic energy? I experimented with the atom, and achieved similar ends, long before the wave of ballyhoo swept over the country in recent years. The idea of atomic energy is illusionary but it has taken a powerful hold on the mind and there are still some who believe it be be realizable.

Tesla's Vacuum Tube

I have disintegrated atoms in my experiments with a high potential vacuum tube I brought out in 1896 which I consider one of my best inventions. I have operated it with pressures ranging from 4,000,000 to 18,000,000 volts. More recently I have designed an apparatus for 50,000,000 volts which should produce many results of great scientific importance.

But as to atomic energy, my experimental observations have shown that the process of disintegration is not accompanied by a liberation of such energy as might be expected from the present theories.

And as for the cosmic ray: I called attention to this radiation while investigating Roentgen rays and radioactivity. In 1899 I erected a broadcasting plant at Colorado Springs, the first and only wireless plant in existence at that time, and there confirmed my theory by actual observation. My findings are in disagreement with the theories more recently advanced.

I have satisfied myself that the rays are not generated by the formation of new matter in space, a process which would be like water running up hill. According to my observations, they come from all the suns of the universe and in such abundance that the part contributed by our own sun is very insignificant by percentage. Some of these rays are of such terrific power that they can traverse through thousands of miles of solid matter.

Properties of Solar Rays

They have, furthermore, other extraordinary properties. This ray, which I call the primary solar ray, gives rise to a secondary radiation by impact against the air and the cosmic dust scattered through space. It is now commonly called the cosmic ray, and comes, of course, equally from all directions in space. If radium could be screened effectively against this ray it would cease to be radioactive.

The scientists from Franklin to Morse were clear thinkers and did not produce erroneous theories. The scientists of today think deeply instead of clearly. One must be sane to think clearly, but one can think deeply and be quite insane.

Today's scientists have substituted mathematics for experiments, and they wander off through equation after equation, and

(Continued on page 118)

I'm Going to Get THAT JOB!

—Accountant & Auditor
—Architect & Builder
—Automotive Engineer
—Business Executive
—Civil Engineer
—Diesel Engineer
—Draftsman & Designer
—Electrical Engineer
—High School Graduate
—Highway Engineer
—Lawyer
—Mechanical Engineer
—Salesman
—Steam Engineer

American School
Dept. GB-23, Drexel Ave. at 58th St., Chicago, Ill.

Tell me how to qualify for job checked. No obligation.

Name.....Age.....

Address.....

The Job You Want Means— *More Money and Greater Opportunities*

Accidents happen—but getting the good job is not an accident and does not just happen. It is a combination of training — experience — and a willingness to use your ability in the interests of your employer.

Every time you apply for a job, you are asked to make out an application stating exactly what training and experience you have to offer. Your record automatically decides the question. So landing the job you want is not so much a question of whether the employment manager likes you personally, but whether your training and experience fit you to fill the position satisfactorily.

Who Will O. K. You for the Job You Want?

Daily we present the qualifications of students and graduates to over 150 employers. We search out openings and O. K. the student as being fitted for the job—all without extra charge. Hundreds have been helped to "cash in" on their training.

Let us help you increase your training, and so get you ready for the job ahead. Promotion is a step-by-step process, and a reasonable amount of extra training will win you an increase of pay several times the cost of the training. And as soon as you are ready, we shall be glad to help you land the coveted position.

It is not an accident that well-trained men secure good positions. Avoid accidents and "play safe" by preparing yourself to fill satisfactorily higher-grade and better-paid positions. Take the first step toward that better-paying job by checking above the kind of work that interests you, and let us send you full information.

American School
Dept. GB23, Drexel Ave. at 58th St., Chicago

THE UNIVERSITY OF THE HOME

NEW LOW PRICES

$2.15 GOODYEAR Firestone Goodrich U.S. AND OTHERS

29x4.40-21

LOWEST PRICES on EARTH

ALL OTHER SIZES IN STOCK

TIRE USERS by thousands all over the U.S.A. vouch for LONG, HARD SERVICE, under severest road conditions of our standard brand Tires reconstructed by the ORIGINAL SECRET YORK PROCESS. OUR **18 YEARS in business** makes it possible to offer tires at LOWEST PRICES in history with 12 month guarantee.—*Don't Delay—Order Today*

BALLOON TIRES

Size	Rim	Tires	Tubes	Size	Rim	Tires	Tubes
29x4.40-21		$2.15	$0.85	30x5.25-20		$2.95	1.15
29x4.50-20		2.35	0.85	31x5.25-21		3.25	1.15
30x4.50-21		2.40	0.85	29x5.50-18		3.35	1.15
28x4.75-19		2.45	0.95	29x5.50-19		3.35	1.15
29x4.75-20		2.50	0.95	30x6.00-18		3.40	1.15
29x5.00-19		2.65	1.05	31x6.00-19		3.40	1.15
30x5.00-20		2.95	1.05	32x6.00-20		3.45	1.25
28x5.25-18		2.90	1.15	33x6.00-21		3.65	1.25
29x5.25-19		2.95	1.15	32x6.50-20		3.75	1.35

REGULAR CORD TIRES

Size	Tires	Tubes	Size	Tires	Tubes
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Radio Power to Revolutionize Wor

(Continued from page 117)

eventually build a structure which has a relation to reality.

I work every hour that I am awake h not with a feverish tempo. Although I l in the midst of the hustle and bustle of N York, I do not time my scientific expe ments to the hectic, jazz rhythm of the h terical metropolis. I work for the future build for the future. Just as today I see t realization of experiments carried on fif years ago, I am now working with a vi toward still greater achievements whi will come to pass a half century hence.

That is my method. After experienci a desire to invent a certain thing, I go f for days, months, even years with the id in the back of my head. Whenever I fe like it, I play around with the proble without giving it any deliberate considera tion. This is the incubation period.

How Tesla Works

Next comes the stage of direct effort. A this point the solution is somewhere in m subconscious mind, although it may tak some time before it reaches the level o consciousness.

As my conceived device begins to tak form, I make mental changes in the con struction, improvements are figured ou and I even operate it. All of this is pr liminary work—all in my mind. When th machine itself is finished, I slip my imagi nary job over it and find they coincid to the minutest detail.

A great development can be expected i rocket propelled machines for purposes o peace and war. With such machines it wi be practicable to attain speeds of nearl a mile a second (3600 miles per hour through the rarefied medium above th stratosphere.

I anticipate that such machines will h of tremendous importance in internationa conflicts of the future. I foresee that i times not too distant, wars between variou countries will be carried on without a single combatant passing over the borde

Infernal Gas Machines

At this very time it is possible to co struct infernal machines which will carr any desired quantity of poison gases an explosives, launch them against a targe thousands of miles away and destroy a whole city or community.

If wars are not done away with, we ar bound to come eventually to this kind o warfare, because it is the most economica means of inflicting injury and striking ter ror in the hearts of the enemy that has ever been imagined.

My paramount desire today, which guide me in everything I do, is an ambition t harness the forces of nature for the servic of mankind. As I see it, we are on th threshold of a gigantic revolution based o the commercialization of the wireless tran

Radio Power to Revolutionize World

mission of power. The principles for this have been discovered by me.

As this wireless energy is converted into a commodity for the use of the masses, transport and transmission will be subjected to tremendous changes. Motion pictures will be flashed across limitless spaces by my system. The same energy will drive airplanes and dirigibles from one central base.

In this new era man will be able to travel safely, and at great speed, to any part of the world—the jungle—the arctic—the desert—mountain tops—over oceans. The instruments by which these wonders will be achieved will be amazingly simple.

These things will come to pass. Some of them are already within the realm of realization. But like those wonders which I predicted and helped perfect nearly fifty years ago—in the early 80's—power transmission is just around the corner. It's coming.

Today I repeat again what I said to contemporary scientists of those earlier pioneering days:

The scientific man does not aim at an immediate result. He does not expect that his advanced ideas will be readily taken up. His work is like that of the planter—for the future. His duty is to lay the foundation for those who are to come, and point the way. He lives and labors and hopes.

How President Roosevelt Keeps Fit

(Continued from page 65)

est in the outdoors than the present President. Before illness robbed him of the full use of his legs he was an all-around athlete, enjoying tennis, hunting, iceboating, swimming, baseball and football.

But although the President's enormous energy is geared to the production peak of a precision-tooled machine, he does not allow his energy to run away with him. He knows when to work and when to rest—a lesson brought home to him in force when in 1921 paralysis struck him down. Deprived of the use of both his arms and his legs and given scant aid from physicians who knew next to nothing about his disease, Roosevelt was forced to work out his own salvation. His subsequent victory was two-fold: physical recovery and a basic knowledge of mental discipline.

Today, a great part of the President's health program is given over to mental relaxation. He is a great reader, enjoys moving pictures, likes to listen to the radio and is enthusiastic about music, both popular and classical tunes.

Indoor games are one of the President's favorite methods of relieving mental pressure. He enjoys rummy, solitaire, bridge and parchesi, playing them all with his characteristic gusto, but never worrying about their outcome. The President is also one of America's leading hobbyists. His stamp collection is noteworthy and his group of ship models and naval paintings and lithographs is one of the most extensive in existence.

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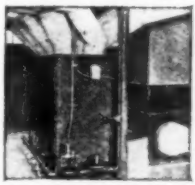

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Planning North Woods Log Cabin

(Continued from page 112)

tight. It is easy to wash. A tip on building floors: on any cabin up to 10'x14', 2"x6" joists spaced 18" apart are more than stiff enough. The main thing is to keep them fairly close together to avoid any spring in the 1" fir flooring.

The rafter plates are left single, instead of doubled. This construction is plenty strong for a small cabin, and the 2"x4"s saved will erect half of the wall of one side. The end studs should be doubled for you need good nailing surfaces in the corners.

If you use log siding, get the thin kind—that is what is known as inch stuff. The usual advertised siding is *two* inch stuff and costs just double for lumber alone, plus something extra for the fancy milling.

Miter the corners, and build around the cabin as you go, or the ends won't meet.

Estimating the Cost

Lumber suitable for building highly satisfactory frame summer cabins can be had for about $32 per thousand board feet. All studding, rafters, plates and sills come at about this figure. Fir flooring will come at about $40 per thousand feet. Doors can be had for four dollars, with frames. Window frames will cost about $3 each.

The first thing of course is the foundation. This does not need to be the usual continuous concrete wall. Wood sills of the rough timber type, sawn out of lumber too knotty to mill, in size 8"x8" will serve very nicely for sills.

Use Concrete Foundations

If the ground is loose, soily or sandy, you will want to dig down to the gravel, which is usually about a foot or so under the topsoil. On this digging you can place a shallow box, pour it full of concrete, and let it set. When it is hard, after a day or so, you can erect a smaller box for the corner piling. If the ground is gravelly or rocky, you can roll a boulder or two into a shallow grave and anchor it with mortar in which a little lime has been added. The top of the boulder can be leveled off with concrete, affording a resting place for the sill. The sill can be adjusted to level by putting the tapered kind of shingle underneath, and tapping the wedges together to elevate either one end or the other until level.

One window can be made to do the work of two as far as view is concerned if it is tipped on its side. Take out the two inch sill at the foot, which has now become the end, and square that end of the frame to match the other side. The arrangement makes the view just as broad as two windows, and the ventilation can be more easily controlled.

In cutting roofing, use the double sided stuff. It costs about 20 cents more per roll, but instead of wasting fifteen or twenty feet out of every roll with the little triangular pieces you cut at the hip of a roof, all you do is turn the roll over and lay on the next lap.

It will be found that little savings like these will total up to ten or twenty dollars for the average small cabin, and that is quite an item in these days!

Mountains Defy Daring Explorers

(Continued from page 59)

height. Next comes ropes; not just ordinary clothes lines, but specially imported ropes for climbing. Each member must wear special boots, with hob nails all about the sole.

To climb safely, three persons are roped together, only one climbing at a time. The two standing still wrap the loose rope about a point of rock or see to it that they can support the climber if he should slip and fall. The leader goes ahead, the weakest is tied in the middle and a strong climber follows.

The Technique of Climbing

The leader climbs like a monkey on a stick, by handholds on strong projecting bits of rock into which he can force his fingers. Sometimes he pulls himself upward by sheer strength of arm muscles. At the end of thirty feet of rope, he braces himself and waits for the second man to ascend to him, and so on, until all three stand together.

Each inch of the way, hazards and thrills accompany the climber. A skilled climber is one who feels perfectly comfortable several thousand feet up the sheer face of a mountain, with his feet planted in cracks just wide enough to hold the edge of a nail.

Mountain climbers do not travel far until they come to fear the avalanche. Way up on the side of a glacier you see a bluish wisp of something that appears like smoke, trailing down the edge of the mountain side. As it travels down the roar grows louder and louder. Presently it terminates in a splash at the foot of the glacier. En route it has not only gathered tremendous momentum, but hundreds of tons of ice, snow and rocks have been broken loose.

When the mountain climber hears the guide shout "Avalanche!" his heart is filled with fear. Disaster and possible death lurks near at hand. The crunching sound of the slide as it breaks off and comes slithering down terrifies the most experienced climber.

Under the Ice Cliffs

On the way to the summit the party will no doubt pass many points leading underneath overhanging ice cliffs, where it seems that even the human breath might dislodge thousands of tons of ice, and the unlucky climbers who chance to be in the way may, in the twinkling of the eye, be buried deeply under thousands of tons of snow and ice. There are many parts of the Swiss Alps where it is dangerous even to whisper, while to shout out loud would spell disaster to the entire party. Sound waves have been known to dislodge tons of ice, snow and rocks.

Ascending a perpendicular rock face calls for all the tricks in the mountain climber's bag. The second climber, usually a novice, must keep his head, even if the handhold comes off in his hand. The rope is merely for moral support, to be pulled on only in the direct emergency. One's rock score is lowered by the slightest unnecessary jerk on the man above.

One of America's most daring mountain climbers was Le Roy Jeffers, F.R.G.S., known as the "lone wolf" of the profession, who

(Continued on page 122)

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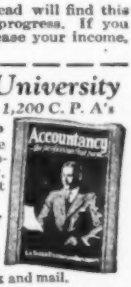

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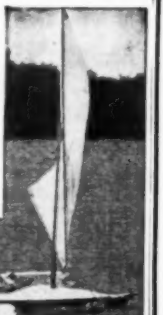

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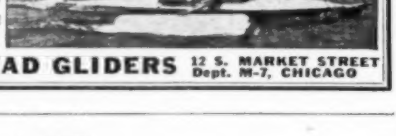

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Mountains Defy Daring Explorers

(Continued from page 121)

made it a custom to venture alone on perilous trips up terrifying peaks where the slightest mishap might have resulted disastrously.

His most notable achievement, which proved his entire fearlessness, was his famous ascent of Mount Moran, king of the Teton Range, Wyoming. A scientific journal, describing this peak, prophesied that it would probably never be scaled. A massive mountain, forming the western rampart of the Jackson Hole country, this peak had turned back a score of trained climbers.

Scaling Mount Moran

Mount Moran itself is 12,000 feet tall, the last 3000 feet being sheer perpendicular walls of rock. One hot summer day, Jeffers penetrated into this miniature replica of the Himalayas, and between daybreak and daybreak, ascended to its lofty crest.

To have made the climb in broad daylight would have been a real achievement; but Jeffers scaled the final stages in the complete darkness of night. At nine o'clock the night when he emerged on the little surface comprising the top of the peak, he found himself, as he reported, "exposed to the unbroken fury of a gale in the inky darkness." This, in addition to the sweeping sleet and the imminent electrical flashes, would have struck terror into any save a stout heart.

The precipitous sides of towering, pinnacled peaks, continue to lure daring mountain climbers. Even the most experienced Swiss guides come to grief.

The summit of old Mont Blanc has been the scene of several distressing tragedies. One time a party of eleven climbers succeeded in reaching the top in safety, when they were cut off by a snow and wind storm.

An Alpine Tragedy

All chance of retreat was cut off, and the party, with insufficient provisions, were imprisoned on this remote spot for eight days and nights. Although people down in the valley camp knew something was wrong, the severity of the storm prevented rescue. On the ninth day the rescue party scaled Mont Blanc, and discovered ten bodies frozen in the deep snow. The body of the eleventh member was never found.

The Matterhorn, 14,000 foot Alpine peak, has always proved a formidable antagonist to man. Edward Wymper's pioneer party reached the summit for the first time in 1865, but three of the men lost their lives in the perilous descent.

The world's highest mountain probably still remains to be discovered. There is a lofty mountain in Tibet, Asia, that is believed to be higher than Mt. Everest. It is known as Ma Chin Shan. No one, except natives, has approached within 75 miles of it.

The adventure, the danger, and the thrill of victory makes mountain climbing one of the greatest of sports. It will always lure the most daring men and it will probably be centuries before all towering peaks on the earth have been scaled.

Robot Planes to Fight Air Raiders

(Continued from page 53)

English inventor, develops his latest invention for combating aerial raids.

Realizing how powerless even the most up-to-date ground defenses are in the face of high speed bombing attacks from the air, Mr. Brown proposes to build robot destroyer planes which will bring down or at least incapacitate enemy bombers the moment they are within range of the defense areas.

Robots to Attack at 500 M.P.H.

As this attacking unit, or "destroyer," carries neither pilot nor armament, and since its entire flight period is a matter of seconds or minutes at the most, Mr. Brown points out that it need consist of little more than a powerful motor and rudimentary wings carrying a minimum of fuel. The steel body containing the steering devices which form part of Mr. Brown's invention and supporting the control surfaces would be correspondingly small and light. Thus it is perfectly credible that today these "destroyers" can be built to exceed the required attack speed which has been tentatively set at around 450 to 500 miles per hour.

The secret of the steering lies in the use of a telescopic sight which is coupled to photo-electric cells and thence to the gyroscopic controls by means of four electro-magnets. Differing from other devices of this nature, the recently suggested control for robot-torpedoes for example, the mechanism is not dependent upon the presence of infra-red rays but is controlled by an ingenious arrangement whereby any disturbance of the photo-electric cells is transmitted to the electro-magnets in such a way as to ensure steering at all times in the direction of the sighted target.

Targets Aligned by Telescope

Thus when the telescopic sight is aligned on the target the image of the bomber falls on any one or all of the four sections of the photo-cell screen. Should the image deviate from center the balance of the cells is upset and less light will fall on one or more of the cells. Mr. Brown utilizes this simple fact to control the electro-magnets in such a way as to correct any deviation from the target.

In practice these minute but powerful "pursuit ships" would be launched at acute angles from specially designed catapults which would also serve to start the motor of the unit as it left the catapult. Light weight plus great power, assisted by the impulse of the artificial start, are expected to ensure that full speed will be almost instantaneously attained and the "destroyer" thus launched will reach the highest bomber at such speed as to be virtually invisible.

For use against day raiders Mr. Brown proposes that the telescopic sighting "eye" be set on an automatically controlled quadrant and that the destroyers be released at a tangent to the target. The difference in the lines of flight would be gradually taken up as the angle of the telescope is automatically and gradually reduced in flight. Thus the pro-

(Continued on page 132)

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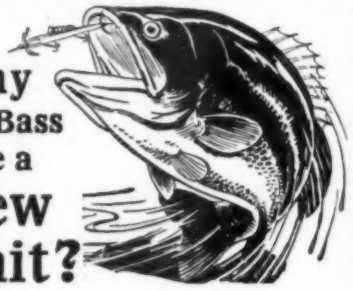

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Build a Trailer for Summer Touring

(Continued from page 99)

flange faces level with upper edges of the joist vertical flanges.

It will be noted that the two joists nearest the wheel wells are considerably above the ends of the channels. These loose ends may be tied together by welding a short piece of angle iron vertically to the joist and channel ends. A spreader welded to the undersides of the chassis at the after bends as shown on the drawings and which is another piece of angle iron of the same size described above will act as the upper support of the fuel tank. For added safety factor, in case of overloading the stowage compartment, we next weld two pieces of ¼"x1¼" strap iron to the bottom of the stern channel bar near the center line and to each pipe chassis member at the point where the after bend is located, just aft of the wheel well.

Parts for the Axle Assembly

Chevrolet rear wheels and parts found in the junk yard are used for the whole axle assembly although there is no reason why the parts of any other car that has a good rugged axle might not be used. In the September, 1933, issue of MODERN MECHANIX AND INVENTIONS, page 94, will be found an excellent method of adapting a rear axle for trailer purposes and so I shall not take up unnecessary space in describing this method. The method of securing axle to springs as shown on the drawings is an extremely simple one and is shown as a second alternative only. To secure the axle assembly to the chassis, four "U" shaped lugs made of ¼" steel will have to be welded to the pipe frame. The exact location and spacing of these lugs will directly depend upon the type and equipment used. Be sure, however, that the clearance between the top of the axle housing and the bottom of the pipe frames is at least 4" when assembled.

Suggestions for the Drawbar

The draw-bar is next in line and two suggestions are offered. The spring arrangement is the writer's first choice and consists of a Ford front axle spring bent in the manner shown and bolted inside a 2" pipe that has been formed to receive it. As each car presents its own problem for hooking on a trailer, the height on the chassis frame elevation is not given and details of connections are omitted. After this height has been determined by the builder, the formed length of pipe is then welded to the two 2" pipe frames and the top of the parking leg housing. Care must be taken not to get the length of the spring shorter than is specified or there will be future trouble at sharp turns. The parking leg consists of two pieces of pipe telescoping within the housing. They are held in position while traveling by means of a pin passing through the bottom ends of the housing and the two pipes. In parking position the pin passes through the housing and the larger of the two pipes as will be readily seen in the detail. A flat metal foot welded to the bottom of the smaller pipe will keep the leg from sinking into the ground.

This completes the chassis and you are ready for framing of sides and roof but be-

Build a Trailer for Summer Touring

fore proceeding a word of advice here may be useful. The water tanks may or may not be used as they are indicated on the drawings, or you may feel that only one will suffice. The writer has found in similar matters that it is better to have too much than not enough when it is most needed. This job is extremely stable because of its low center of gravity. The possibility of capsizing is remote but if this design did not have these features, the low slung water tanks would establish them. Consider then the added advantages here plus a large source of water supply. The method of hanging these tanks is accomplished by welding two iron straps at the ends and undersides of the respective tanks. The free ends of the straps are bent up and over the tops of the pipe frames and welded.

The placing of the tanks concludes all the welding there is to be done and all the heavy iron work. Unless you have ready access to a welder's outfit and know what you are doing, it is strongly recommended that this work be done by a man who thoroughly understands his business. Next month we will take up the body construction and conclude the building of *Aloha.*

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Give Your Car Professional Paint Job

(Continued from page 101)

piece of glass or tin before starting the job.

Thirty minutes to an hour after the last brush stroke is made, the work will be absolutely dry. Look it over. Still rough? Show a few brush marks? Sand it lightly with No. 320 or 280 wetordry sandpaper, but don't go through the color.

Wash off the sanded job with a soft sponge and water, and dry it off with a chamois skin soaked and wrung dry. Then apply another coat of lacquer in the same manner as the first, but with the exception that about 1 part thinner to 30 parts of lacquer has been added to the second coat.

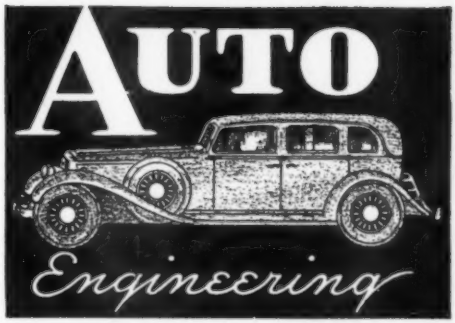
Any good four-hour enamel may be used on the fenders, which are to be sanded, primed, sanded and cleaned like the rest of the body. Two coats will be sufficient.

If you have a spray gun, a properly sprayed and polished job will give added satisfaction.

Up to the time the tacky rag is used, the steps in finishing are the same. The different colors have to be masked off with masking tape and newspapers. This is a little tedious, since it is often necessary to follow curved lines with straight-edge tape.

Cover the windows with a thick paste of water and Bon Ami or the regular masking

(Continued on page 126)



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Give Your Car Professional Paint Job

(Continued from page 125)

cream. Spray over it, and scrape it off later with a razor blade.

Use half lacquer and half thinner. Adjust the nozzle to give a fan-shaped spray. Have the temperature of the garage at 70 degrees. If the room is too cold, the lacquer will have an appearance which resembles "goose pimples" or orange peel. Further thinning helps this some.

Hold the lacquer gun 6" to 8" from the work. Test for the proper length of spray on the practise work. Start at a distance of about a foot from the work, and gradually move the gun closer. When the nozzle is just clearly reflected in the wet lacquer, the distance is right.

Keep a wet edge between spray paths. Don't stop work until one logical unit is completely covered, such as a door, the hood, etc. Let each coat dry thirty minutes to an hour. Two coats of a dark color over a light will be sufficient.

The final result is an "eggshell gloss." This should be rubbed down with rubbing compound, which may be obtained at a paint store.

Will New Submarines Rule the Seas?

(Continued from page 79)

water as men do aboard battleships. The officers have comfortable staterooms. Enlisted men have sleeping berths. There is ample storage space and refrigeration for foodstuffs and electric kitchens for preparing wholesome meals.

The condensation of moisture and dripping of water has been eliminated. The air is constantly reconditioned. During long underwater cruises men may even smoke, except in certain compartments where smoking might be a source of danger, with little or no pollution of the air. Air pressure fluctuations are negligible. There are distillation plants for de-salting sea water for drinking and bathing. When cruising on the surface there is almost as much deck space for sport and exercise as there is aboard a battleship. Talking motion pictures provide entertainment for men and officers off duty—and, if you please—cruising far below the surface of the sea they may turn on the radio and tune in their favorite programs.

The cruising speed of the modern submarine, both under water and upon the surface, has been enormously increased. It has a vertical range that is incredible and its fighting equipment is infinitely more deadly than anything used during the World War.

The modern periscope is another triumph over the crude equipment of World War undersea boats. The officer using it has several different kinds of telescopic vision and can work more tricks with a periscope than an architect with a slide rule. In addition there are delicate mechanical "ears" for locating surface ships and storage compartments that permit the carrying of airplanes for surface scouting.

The deck armament of the modern diver

(Continued on page 129)

A Simple Boat for Your Outboard

(Continued from page 104)

thickness of the planking. Now make up the frames. When done they'll look like the ones shown on page 104.

On the heights above baseline plan, draw in the stem and the keel and the transom knee. Lay the lumber for the stem under the paper, and take a dressmaker's wheel awl and prick through the paper to outline the wood. Then, either by hand, or by bandsaw, the rough outline of the stem and the transom knee is cut out, and you fair the faying surfaces (the surfaces which come face to face in a joint) and fasten them with the prescribed fastenings.

Holding Frames Against Keel

You will need a strongback table on which to build your boat. One of the drawings shows a way of using sawhorses. The main idea is to get a plank backbone of some kind on which you can fasten cross pawls to hold the frames up against the keel and in line until they have been fastened to the keel and until the seam battens have been put in.

The transom, being one of the frames, is built at the same time the frames are, and should be lined up between perpendiculars with the center line of the keel following the straight edge. A plumb bob dropped down between the straight edge and the centerline marked on the backbone plank will line the frames up for you.

From the heights-above-baseline plan mark the stem and transom knee parts. Cut and fair these and mark the "rabbet line" with the dressmaker's awl. This rabbet is not cut until the boat is in frame. On the strong back have all the frames clamped in approximate positions, the stem clamped and the transom lined up.

The keel is a piece of 1½"x2½" white oak —be sure it is *white* oak and nothing else. Have the rabbet partially cut out on a circular saw. Drop the keel in place and fasten with screws. The frames have been carefully boxed as this detail shows, and the edge of the rabbet is slightly above the frame, so that you can now start in and with a mallet and chisel work the rabbet down to the proper angle, using the angles of each frame as a guide. See detail of section 3.

Fastening the Battens

Fasten the chine in place and bevel the frames so that they will present a flat surface to the planks and the rib-bands or battens that are to be fastened in next. These battens are ⅜" by 1½". They are laid in at what will prove to be the seam centers about every six or seven inches apart. The ribs are boxed with saw and chisel and the battens are put in first on the sheer, then next the chine, then the center batten. This will stiffen the framing up immeasurably before the bottom battens are put in. Look at the photo and accompanying details and the mysteries of these battens will fade completely.

There is one thing about their spacing that you'll have to be responsible for. That is determined by the amount of width in the planks you use. Bear in mind that in a boat,

(Continued on page 139)

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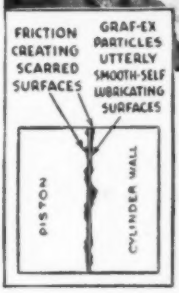

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"Shooting" Game With a Camera

(Continued from page 91)

sider: 2¼x3¼, 3¼x4¼ and 4x5. Naturally the 3¼x4¼ represents a happy medium.

Accessories to consider are: tripod, exposure meter, lens shade, sky filter, Wratten K-2 filter, telephoto lens, a synchronizing device, a film changing bag, a waterproof hood to protect the camera from rain, when set up near a trail; a spool of fine fish line for tripping the shutter from a distance; a metal mirror for reflecting light into burrows and nests; and three squares of cloth for backgrounds, white, gray and black.

Camouflaging the Camera

In the case of sharp eyed birds, and animals with keen noses, it will be necessary to set up a camouflaged camera near a trail, den or nest, and hide at a safe distance, perhaps watching through binoculars. The shutter may be conveniently tripped with a small cord in length up to several hundred feet, if proper adjustment of an antinous release has been made. Obviously a direct pull on the shutter release would jar the camera too much, or perhaps pull it over.

The antinous release arrangement provides for firing the flash and tripping the camera shutter at the same time. With a little ingenuity the amateur can rig up somewhat similar arrangements. Electric flash lamps can be fired with flashlight bulbs. Fish line can be fastened to bait that will lure the animal and to a switch to close the circuit and set off the flash.

The most common method of camera hunting is that of operating the camera from hand, when game is surprised or "shot" unawares from a blind. This method requires long focus lenses, such as a 14" telephoto lens of F. 5.6 to F. 4.5 speed. This is the most thrilling sport, since the camerist is in close contact with his subjects, and must exercise the utmost woodcraft ability. Even though the animal is some distance away, the telephoto lens enlarges the image and provides a good closeup.

"Shooting" Deer and Moose

There is a real thrill in quietly paddling and drifting onto a deer or moose (the usual game for this method of camera hunting) feeding along a lake shore. One or two cameras are rigged up in the bow of a flat bottomed boat with dual flash guns (since the proper charge would be too heavy for one pan), and the synchronizing device. A high powered light is used for shining the game's eyes. It is seldom possible to get closer than thirty feet to a big game animal in this manner, and it is difficult to accurately judge the distance after dark. The advantage of two cameras, one set for twenty-five feet, the other for thirty-five feet, will be apparent.

Now with the advent of flash bulbs, and simple synchronizing devices on the market, many camerists will elect to use their regular cameras and these bulbs for night jacking photographs on their vacations.

Will New Submarines Rule the Seas?

(Continued from page 126)

is such that if a submarine on the surface meets an enemy destroyer in the open sea she will probably fight it out with the destroyer without submerging. In such a battle the odds would all be in favor of the submarine. She has only to submerge to the awash position, keep her bow toward the enemy thus presenting an almost impossible target and pour shells into them.

New Submarines Dive Rapidly

One of the greatest hazards of the World War submarine was the length of time it took to submerge after being sighted on the surface. The modern submarine, however, can snap her hatches shut and dive like a cormorant.

As in the World War, commercial shipping will be the submarine's "meat" in any naval conflict of the future. The modern fleet submarine is also intended for operations against the enemy's surface battlecraft. They will get in their licks from below while destroyers, cruisers, and battleships punish him on the surface; and airplanes harass him overhead.

In spite of the efficiency and deadliness of the modern submarine and the tremendously important part such vessels are certain to play in any naval conflict of the future it is not a navy in itself.

Against the threat of the submarine, battleships have been speeded up and fitted with blister hulls, the most effective known defense against torpedoes. Submarine effectiveness is also challenged when surface fighting ships cruise at high speed on a zigzag course, rendering torpedo marksmanship exceedingly difficult.

The steel battleship put the wooden battleship out of business. Increased gun power increased the thickness of battleship armor. Against the threat of aerial attack came fighting airplanes, anti-aircraft guns of high efficiency, and batteries of anti-aircraft machine guns. Against the threat of the automobile torpedo came effective measures for destroying the vessels carrying the torpedoes, and the blister hull that renders the effect of the torpedo like the efforts of a man trying to destroy a mattress by kicking it. The challenge of the submarine in the World War was met by mine, net, bomb, and ram; and while these methods may not be wholly effective against the modern submarine, it may be said here that the American Navy Department has a lot of things up its sleeve not to be told for publication.

Building a Balanced Navy

The rank and file of level-headed Americans who believe our peace is best preserved by adequate national defense, may rejoice in the assurance that our Navy Department is open-minded upon the subject of new weapons. There is good ground for national rejoicing that the recently-enacted Vinson Bill provides for an American navy second to none—a balanced navy of battleships, cruisers, destroyers, submarines, and aircraft—the type of navy the United States must have until such time as the world is ready to beat swords into ploughshares.

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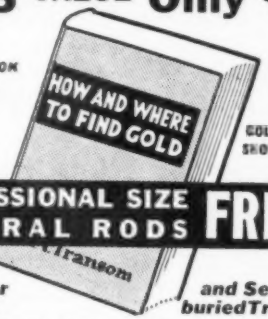

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Some Tips on Bass and Trout Fishing

(Continued from page 83)

Aside from bait fishing you will at times find use for the spinners. Generally these spinners are to be had put up on wire shafts on which they revolve. Some come with proper sized flies attached. Others have the safety pin clasp device without a fly, and a bare hook may be inserted. By attaching a worm or the strip cut from the side of a shiner to this hook, the bait may be let down with the flow of the current to take many trout. This is a method especially desirable in fishing rugged streams. You will find it unnecessary to use a larger spinner than the No. 2 of oval pattern and preferably gold plated. Spinners smaller than this are also useful in combination with small flies.

Number of Flies on Leader

It is hardly ever necessary to use more than two flies on a leader, and in clear waters it will be found suitable to use only one. The leader need be no more than four to six feet in length, graded according to the size of trout.

In fly fishing the essential thing to remember is to select flies that resemble as far as possible the natural fly found on the stream. Observe the flies on the bushes overhanging the stream or floating on the water. By picking a fly from your fly-book somewhat like these natural flies in color your chance of a catch is increased. Flies coming in brown, gray, black and other subdued colors are the most natural. Never go over the No. 8 size fly for average trout, while the No. 10 and 12 sizes are by far the most desirable. It is the writer's belief that if more of the No. 12 size were used in average trout fishing the luck would be far greater. In fishing the superlatively clear mountain pools in the high altitudes of the West, the No. 14 and 16 midget fly types are best. If the water is much disturbed, it is possible to use the No. 8 trout fly most successfully.

In landing your trout do so by heading the fish into the landing net. Do not scoop the fish up by directing the net over the tail and toward the head. This all too often leads to the loss of the fish.

Studying Trout Habits

Unless a study is made of both the trout and the bass the fisherman does not get the most out of fishing for them. The habits and movements of the fish must be ascertained. In the case of the trout especially, the fisherman should observe the insects and various foods that the fish absorbs, starting from early spring on through the summer.

The habits of the black bass are sometimes beyond the knowledge of the fisherman. It is possible, however, to sketch out approximately the movements of the large mouth bass in the course of the summer, whereby one may be led right in his fishing. During the early part of the summer, after the bass are through spawning, they may be taken in more or less shallow water with surface baits, wobblers and top-water commoting lures. As the heat of the summer grows more pronounced the time that the bass feeds changes

(Continued on page 134)

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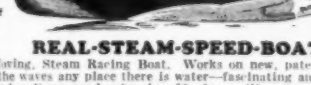

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29x5 00-19	2.85	1.05
30x5.00-20	2.85	1.05
28x5.25-18	2.95	1.15
29x5.25-19	2.95	1.15
30x5.25-20	2.95	1.15
31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	1.15
30x6 00-18	3.40	1.15
31x6 00-19	3.40	1.15
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Install Sail Rig on Your Canoe

(Continued from page 93)

always stay in place. If the bolts have square shanks at the head, file the holes a bit first.

Either spruce or 1" diameter bamboo may be used for the two booms. The boom jaw which fastens with screws to the lower boom is a 3' length of ½" seamless steel tubing with walls .040" thick. Plug one end, fill with fine sand, then plug the other end tightly. Heat the tube to a cherry red and bend to shape. Empty out the sand, flatten one end, drill holes, and cut to size.

The sail may be made from pre-shrunk grade "A" cotton (sometimes called airplane cloth), from best grade 88-88 muslin, or from lightest weight sail cloth. Eight yards of 36" wide material will be enough, allowing for waste. Space the eyelets 6" apart along the booms, punching holes for them first. Be sure to tighten the eyelets, so they do not tear out later. Double stitch each seam, holding the material snug to prevent gathers.

Sandpaper all wood surfaces carefully. Apply three coats of the best spar varnish, sandpapering lightly between each coat.

Start the assembly by hooking up the two booms and locking the screweyes together. Lay the sail down on a clean floor and lace to the booms, using ⅛" rope and locking every fourth tie with a double knot.

Measure one-fifth the canoe length from the bow, and screw the mast cleat fast to the keel. Clamp the mast brace temporarily in place and set in the mast. Line up vertically by eye, then clamp the brace to the gunwales.

Put on the lee-boards after the canoe is in the water. Hoist up the sail and your sailing canoe is all ready to swing into the breeze for a trial spin.

Blue-line prints with these Canoe Sail plans enlarged many times have been made up on tough paper to stand the roughest of handling in the workshop. These enlarged drawings will greatly aid the builder who intends to make this sail rig. The print can be secured for 50c postpaid from M-M Blueprint Department, 529 So. 7th St., Minneapolis, Minn.

Robot Planes to Fight Air Raiders

(Continued from page 123)

jectile would approach its victim at a fairly normal angle of climb and then attack vertically from beneath.

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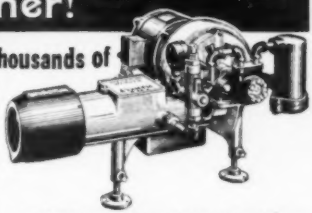

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Some Tips on Bass and Trout Fishing

(Continued from page 130)

considerably. The routine they follow approximately as follows:

They start feeding in the inshore waters the shallows and among the pads from before daybreak to just after the first rays of light are on the water. They feed heavily for an hour or so and then suddenly taper off in their feeding about five o'clock. At six o'clock the feeding will be practically over and they begin to move out into the deep water where they spend the day. They remain in the deep water throughout the day, but begin to work inshore again about four or five o'clock. They will be feeding heavily again at six o'clock and from then on into the night (or to midnight for that matter), they will be taking food. The bass, like the wall-eyed pike, is nocturnal in its feeding habits, that is, it is apparently able to see in the dark.

Bass Feeding Hours

It will be observed that during the hours the bass is feeding the fisherman is not on the waters at all. Rarely does the fisherman get on the water in the morning until seven o'clock, at which time the bass will be in deep water. Starting at seven o'clock and on through the day the bass fisherman will be pounding the pads in the effort to take bass when, save for a few specimens that have elected to stay in the inshore waters in spite of the heat, no fish will be encountered. In the afternoon, after a hard day of casting on the waters, the bait caster is ready to call it a day and pulls in and goes home—at just about the time the bass are again coming in to feed. Thus unconsciously the bass very skillfully evade the fisherman. If he would have better success at his fishing he should be on the waters before daybreak, in fact while it is yet dark and one is unable to see ten feet ahead.

Fish for two hours around daybreak. And return to your fishing at five or six o'clock in the evening and fish until at least ten o'clock. Bass are more or less able to detect the lure on the water, and if it cannot actually see it, will know where it is by the sound created by the bait you pop on the surface. By way of explanation, when you pop a surface plug all that you do is jerk it with the rod tip as you reel it, the idea being to boil up the water to make the fish believe that it is some creature that is maimed.

Popping the Floating Plugs

There are a number of floating plugs that may be popped. Some of these have scooped out heads, metal collars, and other devices that offer resistance to the water. Hinged-in-section minnows, also those so-called wounded or injured minnow types that float on the surface, are well worth adding to the tackle box, especially for early morning and night fishing.

When it is cloudy or when it is raining or drizzly, bass are likely to stay inshore all day.

When the pads and weeds grow up thick in the summer it will be found that the bass move into such thickets of vegetation to feed.

(Continued on page 137)

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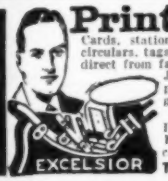

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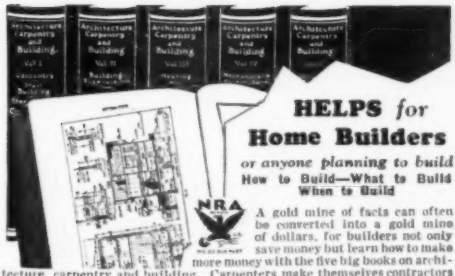

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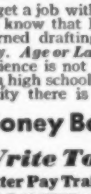

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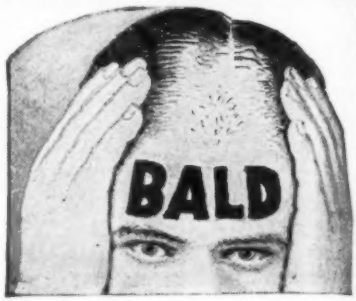

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Some Tips on Bass and Trout Fishing

(Continued from page 134)

for here, too, the minnows and all manner of food the bass feed on keep themselves. Under conditions of this sort, the plug lure, liberally covered with hooks, is of little use. It would hook up on the vegetation badly, but it is possible to use the pork rind lure, with its wriggling pork rind strip most effectively, casting up into the densest of the pads.

Fishing the Pad Thickets

In fishing the pads a long common cane pole of ten or more feet is often used effectively, a live frog being used. The value of the long cane pole is that, once you have hooked your fish, it can be kept above the pads, and deterred from diving into the midst of them. The long cane pole and live frog is also used effectively in fishing off of the reefs and bars in the middle of a lake in hot weather. Usually the bass congregate around and along such reefs during the hours ranging from morning through the middle of the day and afternoon. Have a long cane pole, a strong silk line, a common bass hook, with a bobber on the line about six or eight feet from the frog lure. Move along just outside of the reef, rowing slowly, dropping your frog down here and there. Sooner or later a school of bass will be struck and the fun begins. The writer has taken the limit in bass as fast as the lure could be put down in fishing off of the reefs in the middle of a hot day.

Both the large mouth and the small mouth bass, its close relative, can be taken with the fly rod. Row along slowly just outside of the pads and observe where a bass is feeding, denoted by the swirls or movement it makes in the water. Drop the bass bug to the water, but do not move it. Permit it to lie perfectly motionless on the water. After a time, say a half minute, move the bug about six inches on the water and again permit it to rest motionless. If nothing happens, again move it forward. The bass may have been inspecting the bug at close range, and it may take three moves before he will strike.

Bass Flies and Spinners

Aside from the bass bug in its numerous varieties, sizes and shapes, also various bucktail lures, such as the mouse lure, there is the fly and spinner combination. A bass fly is best that has no wing feathers at all, merely the inch-long hackles at the head. Use the fly on a shaft which has a No. 2 gold plated spinner, and let the fly be the No. 1-0 size, the hook preferably being the hand-forged O'Shaughnessy type which has the best and the most perfectly balanced bend and holds the fish better. Bass often grow wise to plug lures used numerously, day in and day out, on the waters. In well-fished lakes the bass eventually learn to leave these large lures alone. The fly rod being rarely used, the introduction of the bass bug and fly and spinner comes as a distinct surprise. Therefore, between the fly rod and the bait rod, the fisherman has his choice, depending on the waters he is fishing.

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29x5.00-19	2.85	1.05
30x5.00-20	2.85	1.05
28x5.25-18	2.90	1.15
29x5.25-19	2.95	1.15
30x5.25-20	2.95	1.15
31x5.25-21	3.25	1.15
28x5.50-18	3.35	1.15
29x5.50-19	3.35	1.15
30x6.00-18	3.40	1.15
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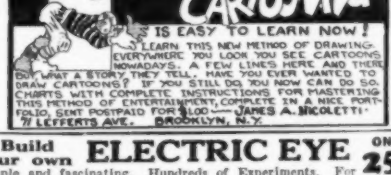

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A Simple Boat for Your Outboard

(Continued from page 127)

none of the planks that look so flat when they are on the boat are straight. They must all be curved slightly in order to go on the boat fair. This amount of curvature is generally determined by spiling, which is simple boat builder's English for fitting one plank against another as you go along. Just divide the frame heights above the chine into three equal parts on every frame and the spacing will take care of itself. On the bottom, you can fit the garboards, put in the garboard batten, and then fit the next plank with clamps to hold it in place before putting in the batten for this second plank.

Build Planking of Mahogany

The planking is ⅜" mahogany fastened with ¾", No. 6 screws. Mahogany costs no more than ordinary white cedar in most localities, and must of course be the hard, red Honduras mahogany. As second choice you can use cypress—clear stuff—and add a little to the thickness and weight by specifying 7/16" to ½" for the thickness. Cypress doesn't hold fastenings as well as mahogany —particularly screws, so maybe you had better use copper clinch nails and drill undersized holes every time you place a fastening in, clinching the nails against the oak on the inside with a clinch iron.

The chine of this boat is not rabbeted, for simplicity's sake. Therefore it is heavier than normal so as to hold fastenings and to give bearing surface. Outing flannel strips, soaked in marine glue or heavy thick white lead, are laid on under each seam between the batten and the planks as you go along and also between the chine and planks. The rabbet at the stem and the fastenings at the plank ends of the transom do not have to be underlaid with anything but paint. The bearing underneath is sufficient to care for swelling and the wood will swell tight against the paint of its own accord.

Determining the Rabbet Angle

When putting on the planks toward the stem, the amount of angle for the rabbet, its depth and curvature, can be better determined by the amateur if he cuts and fits the rabbet as he goes along. Make the fit obvious from the way the planks want to fall in toward the stem, and use the rabbet line shown in the drawing as a guide.

Here's an additional word of help: in planking the boat up forward, particularly on the first frame between chine and keel, the straight frame may have to be fitted with a little concavity. About one inch concavity will do the trick. This is to help get the first two or three planks onto the stem in good shape. The photos and the drawings show this to be a straight line, but if your planking lumber isn't limber enough to make this bend without a hump, the concavity may be resorted to. It will solve the difficulty.

Plank by plank the boat will go together. If you are working after hours, a plank a day is good progress, and should take three to four hours to properly fit. Don't rush this step of the work.

(Continued on page 141)

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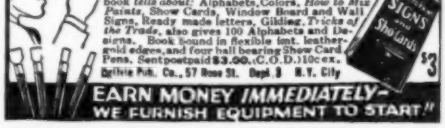

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A Simple Boat for Your Outboard

(Continued from page 139)

Of course, with the seams backed up by battens, air tight fits aren't required. Planks this thin aren't caulked except along the keel rabbet. If the seams are too tight the planks will buckle and swell when they get wet.

Remove the clamps after the whole job has been carefully sanded. Put on a light thin coat of gray primer paint, thinned with turpentine. Take the boat off the frames, and unfasten the cross pawls.

Now the inside is cleaned up. All nails and screws that didn't quite hit home are removed and replaced after plugging the holes. Then the inside is given a primer. Make it thin so that it permeates the wood.

Then lay in the flooring. This is held with screws so that it can be removed. The scantling sizes are shown. The spruce floors are held to the frame with rivets or 1¼" screws.

Fitting the Accessories

The clamps, seats and row lock blocks are simple matters and the trimming of the inside will probably occupy but a matter of two evenings. The seat risers are fastened with 1½" No. 8 screws. Then sand the seats well, as the knees too, and the boat is ready for the final touches. Unscrew the seats after they have been fitted and paint the interior to suit your fancy. Put on a couple of rather thin coats of paint, rather than one thick one, as the water will cause a thick one to peel. After the paint dries thoroughly, fasten the seats in, and after sanding the outside, paint it a final coat or two, letting each dry well, and sanding before the other is put on.

All you need now is a pair of seven foot oars or an outboard motor and *Skedaddle* is ready for the launching ceremonies.

Here is a list of lumber required that will help you in getting an estimate from your local dealer:

1 pc. 6'x6"x1¾" w. oak—stem and knees.
1 pc. 1½"x2½"x12' w. oak—keel.
50 lineal feet ¾"x3" spruce—frames.
100 lineal feet ⅜"x1½" w. oak—battens.
20 lineal feet ¾"x10" w. pine—seats.
2 pcs. 1¼"x1¼" 14 ft. spruce—chines.
2 pcs. 16' ⅜"x1½" spruce—sub rails.
Spruce for transom.
2 gross No. 6x⅝ F. H. Brass screws—planking.
Bolts and fastenings as specified.
3 quarts gray paint.
2 quarts varnish.

BLUEPRINTS FOR SKEDADDLE

Workshop blueprints, illustrating details of construction, can be obtained for $2 from the Blueprint Department, Modern Mechanix and Inventions, 529 S. Seventh St., Minneapolis, Minn. These blueprints on heavy durable paper are made to scale from the original drawings of the designer, Weston Farmer. The drawings will greatly simplify the problem of laying out full size lines.

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Great Fortunes Await Inventors

(Continued from page 85)

cards become soiled very quickly and there is needed some sort of a cheap little playing card renovating machine. It should take the form of a crank-operated device into which cards could be fed and from which they would be delivered at the opposite end clean and white. Such a machine could be sold in large quantities for a dollar and there might be extra revenue in royalties from a special cleaning fluid which might be operated with or without the machine.

A new ash tray would be acceptable for use in public places such as auditoriums. The device should fasten to the back of the chair easily and should extinguish lighted ends as fast as they are placed inside. The tray should be attachable without the use of screws.

A device that will permit radios to be preset for each day's broadcast so that they will thereafter automatically tune in the desired programs would be a big money maker. It should not add over ten dollars to the cost (not selling price) of a radio set.

Predict Made-to-Order Weather

(Continued from page 69)

rain or move upward in the form of clouds.

In Holland a chemist named Veraart caused rain to fall by dropping dry ice on clouds. He went up in an airplane carrying 3,200 pounds of ice, rose above the clouds and scattered his cargo. The ice, causing condensation, brought rain to an area about six miles square.

In Germany thunderstorms have been broken up with rockets. The experiment was tried on the theory that a horizontal wind can not force its way through a bank of thunderclouds and break up the oncoming storm. A rocket pierces a hole in the clouds through which the wind passes and finally scatters the clouds. The experiment was tried after soldiers of the World War observed that heavy bombardments often dissipated storms.

Clouds are made up of minute drops of water, each charged with a small amount of electricity. If this electricity can be discharged rain can be drawn. It is on this theory that Haight built his electrodome in California to protect citrus farms from fog and frost.

Fog consists of tiny kernels of salt in a shell of condensed air, charged with positive electricity. A negative charge, therefore, would dispel fog.

Although attempts to control weather have been successful in these and other experiments, the devices used are not entirely practical from the standpoint of cost. Scientists, however, are nearing solution to the problem. It is quite probable that man in the future will be able to produce weather to suit his needs and to destroy the disastrous effects of storms, droughts, and heat waves.

Scientific Marvels of the World's Fair

(Continued from page 36)

cess throw herself into the mouth of a flaming volcano as a sacrifice to the gods. The volcano replaces the A. & P. carnival of 1933 and will provide a background for a Hawaiian garden seating 1,500 diners. A combination of smudge pots, electrical lighting, and rubber sponges, resembling rocks, have been ingeniously used in producing the volcano sensation.

Among the features shown on the lagoon is a radio controlled boat maneuvered at the will of an operator on shore. There, too, is the water theatre, with its "floating" stage, terraces, and restaurants.

Huge Patent and Model Display

Inventors can enjoy a huge patent and model display in the Travel and Transport buildings. It features early and modern inventions. Amateur photographers will want to see the latest wonders of cinema and still photography and listen to helpful lectures in the Hall of Photography in the Science building.

Home lovers will want to see the Crystal House, made of glass panels with a prefabricated steel frame. The ground floor walls are of light-diffusing glass through which persons outside can not view the occupants within. The upper floors are of transparent plate glass. All equipment and furnishing are examples of the latest developments for home comfort.

For the first time the public is able to hear and see those messages from unknown worlds, the cosmic ray, trapped and harnessed in an apparatus called the hodoscope. Only two of these instruments exist in the world. The hodoscope, converting the mysterious rays into electricity and light, suggests that man may derive a practical use from this adventure into a scientific wonderland.

Practically all basic science exhibits have been changed or improved. One interesting section is devoted to models showing the fallacy of man's dream of perpetual motion. Another shows models of string, illustrating geometric and other mathematical principles.

Free Scientific "Circus" Shown

In the great court of the Hall of Science a daily free scientific "circus" is being presented. At the east end of the court a huge stage has been erected and 10,000 free seats provided. Two huge screens show scientific films and television, while a complete radio station can be wheeled upon the stage to communicate with sixty different countries.

On a platform on one side of the stage a reflecting telescope will nightly capture the light rays from the star Arcturus. The ray will then light the Century of Progress beacon, a huge torch of gas flame.

These are but a few of the outstanding attractions of the World's Fair. No short article can do justice to that great panorama of marvels being unfolded on Chicago's lake front.

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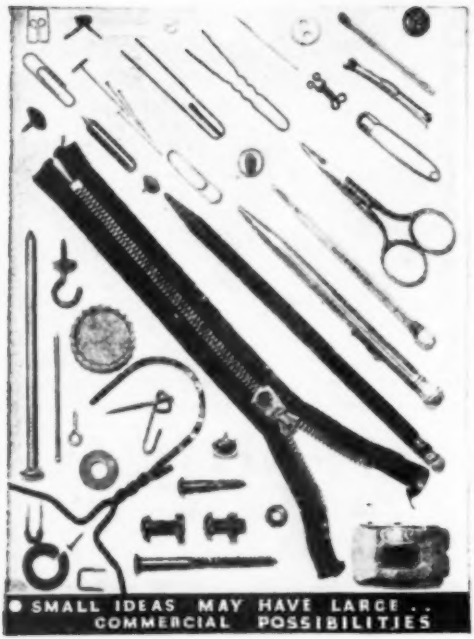

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New Inventions Anticipate Public Demands

Hailed as an aid to swimmers, these rubber paddles slip over the hand and are held by a strap around the wrist.

A new auto finish compound, applied with a cheese cloth pad, restores luster of finish in a simple operation. Once thoroughly dry, the finish is both dustproof and waterproof.

New metal joints simplify the task of building sawhorses, trestles and understaging. No nails or screws are necessary. Lumber is merely tapped into vertical and horizontal grippers.

A radio device now available consists of a brass cylinder which can be used either as an aerial or a ground. Cylinder is driven into ground and is filled with dry chemicals which are diluted with water to increase reception.

A saw blade attachment for lawn mowers strips dandelions and cuts weeds and high grass.

Made of bakelite, this 4-cigar case automatically delivers a cigar when lid is slid back.

A folding enlarging camera will accommodate negatives up to 3¼ by 4¼ and makes 11 by 14 prints.

Plywood game boards held on players' knees eliminate the former nuisance of buckling legs on card tables.

An electrically driven razor blade sharpener hones and strops both edges of blades simultaneously.

Wooden sponges, made of cellulose, are said to be tougher than natural sponges and are free from odor.

An English motorcycle which stresses riding comfort features duplex steering, front and rear springing and a four speed transmission.

A new type fire extinguisher has the pump on outside of container, preventing jams or corrosion. Pump does not contact liquid, forcing it out by means of high pressure.

Flower-scented candles lure Japanese beetles to this trap. Insects drop through funnel to turpentine solution below.

A perambulating room cooler of half ton capacity is now available for hot weather use in home or office. The device is mounted in a rubber-wheeled cabinet no larger than a console radio.

A new keyless auto lock is a combination affair, locking ignition and the hood from under the dash. Device is removable when car is sold.

Removing insoluble dirt and grease from cold-rolled steel is possible with a new process eliminating brushing or other mechanical cleaning.

A window lock device permits locking window in place, frustrating entry or further raising by children.

Washable wallpaper, now on the market, is waterproofed by the adhesive which binds colors to the paper.

Photo shows elastic supporter which keeps trouser waistband fitting snugly at all times.

Editor's Note—Information on any of these items can be obtained by writing MODERN MECHANIX AND INVENTIONS *and enclosing a stamped and self-addressed envelope. Manufacturers are invited to submit material for this page.*